

The Iron Age

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An Account of a Chemical Laboratory Erected at Wyandotte, Mich., in the Year 1863.*

BY W. F. DUFFEE.

In the year 1862 the author of this paper was called upon to design and superintend the erection and working of the machinery of an experimental works for the production of steel by a process discovered by Mr. William Kelley. These works were located at Wyandotte, Mich. Mr. Kelley's invention was, as is now well understood by all who are familiar with metallurgical matters, identical in principle with that which is now known all over the world as the "Bessemer process." Very soon after entering upon the study of the theory of the process (for practice at that date in this country there was none) it became evident to me that an accurate knowledge of the chemical constituents of the metals and other materials employed was essential to its successful conduct. I reasoned that as all pig irons did not form the basis of equally good wrought irons, so there was no probability of uniformly good steel being produced from miscellaneous pig metal; and, further, that while in the then state of our knowledge it would be impossible to predict from chemical analysis just what was the best iron for the new process, it would be possible, after having demonstrated by experimental working that certain irons were and others were not suited for our purpose, to make an analytical comparison of them, the result of which would be a permanent guide for future operations, enabling us to determine by analysis and comparison whether any offered brand of iron was of suitable quality, thus saving a large outlay for direct experiment in the "converter," and serving as a check upon the running of the blast furnace, as well as a guide in the purchase of metal and other materials. These considerations, and others of an administrative character, determined the construction of a chemical laboratory as an adjunct to the works. The importance of a thorough knowledge of the chemistry of the new process, and the necessity for a laboratory in close proximity to the proposed works to facilitate the attainment of such knowledge, was promptly recognized, and the construction of the laboratory cordially approved by the late Z. S. Durfee, who was acting as secretary of the parties in interest (of whom he was one), and in the spring of the year 1863 he secured the services of Mr. Emil Schalk, a native of Germany, and a graduate of the Ecole Centrale of Paris, as chemist. Mr. Schalk purchased a stock of chemicals, together with necessary glassware and other apparatus for use in the laboratory, but as the building was not completed when he reached Wyandotte, he, at the request of the late Capt. E. B. Ward, assisted in the organization of an exploring party, which he accompanied to Northern Wisconsin; the result of this expedition was the discovery of a number of deposits of iron ore. On Mr. Schalk's return in October (1863), the laboratory being finished, he at once proceeded to analyze the samples of the ores he had discovered. I am able to give his analysis of four of these samples.

Sample 1.	Sample 3.
Iron..... 59.70	Iron..... 50.16
Oxygen..... 22.47	Oxygen..... 19.21
Silica..... 17.63	Silica..... 29.40
Magnesia..... .16	Magnesia..... .60
Nickel..... trace	Nickel..... trace
Loss..... .02	Loss..... .08
100.00	100.00
Sample 2.	Sample 4.
Iron..... 53.30	Iron..... 49.90
Oxygen..... 20.18	Oxygen..... 19.01
Silica..... 26.30	Silica..... 30.02
Magnesia..... .30	Magnesia..... .90
Nickel..... trace	Nickel..... trace
Loss..... .03	Loss..... .17
100.00	100.00

Mr. Schalk also commenced some original investigations with a view to the determination of the influence of nitrogen upon steel; these promised to develop very interesting and valuable results, but, unfortunately, circumstances for which Mr. Schalk was in no way responsible caused his resignation in December, 1863, before they were completed. Of Mr. Schalk's abilities I had the highest estimation, and I very much regretted his departure from Wyandotte. Having described the inception and initial work of the Wyandotte Laboratory, I will now call your attention to its arrangement, and also to some of the apparatus employed. As shown by the plan (Fig. 1), the main building was about 24 feet square; it was divided by a partition into two rooms, A and B, of equal size, which communicated by a door at Z. At the rear of this building was a lean-to shed, C, which was entered from without by the door d, and from within by the door x, communicating with the room A, at the opposite end of which was placed the entrance door y. The room A was used for general analytical work; it was provided with three work tables, the requisite shelving for reagents and apparatus, a large pair of balances, a sand-bath furnace having a hot-water reservoir attached, a small assay furnace, a sink, an abundant supply of water and an oxy-hydrogen blow-pipe, the gas holders of which were located at O H. The room B was provided with a stove, a desk, assay balances, shelving for specimens of minerals and metals, a work table having a case of shelves above it, at the end of which, at P, was

placed an apparatus by which permanganate of potassa was used for determining the amount of metallic iron in a solution of its protochloride by titration. Of the construction of this apparatus I shall presently give the details. The rooms A and B were about 18 feet in height and were amply lighted by the windows W.

In the corner of the lean-to shed C was placed a "melting hole" large enough to receive a pot containing 70 pounds of melted metal. For convenience the top of this melting hole was placed on a level with the floor of the shed, and blast was supplied from the blowing engines of a neighboring furnace by means of an underground pipe. In the room C was kept a stock of crucibles, the tongs and other tools used for working the melting hole, an anvil, hammers of several sizes, an iron mortar and pestle, and sundry supplies, such as clay, sand, charcoal, &c.

ter of the upper end of the graduated "burette" B. This "burette" is supported by the clamps C, C, from which it can readily be removed for cleaning; its lower end is provided with a pinch-cock, K, having a glass adjutage, J. When the apparatus is not in use there is a piece of plate glass, G, interposed between the top of the "burette" B and the outer end of the tube T; this effectively prevents dust from entering either the "burette" or the tube. To the right-hand neck of the bottle A is fitted a tube, U, whose inner end communicates with the space above the solution in the bottle, and after passing through the cork, it descends perpendicularly, and passes through the cork in the left-hand neck of the small two-necked bottle S, into the space above the concentrated sulphuric acid, with which the bottle is nearly filled. The right-hand

the air pump P. From the "burette" the permanganate solution can be drawn by the pinch-cock K into the solution of protochloride of iron contained in the beaker V, rapidly or slowly, as the rate of oxidation requires. The apparatus described, when once arranged and provided with a properly standardized solution, is more available and convenient than any other within my knowledge intended for a similar purpose.

At the time of which I am speaking, among the many practical questions that were presented for solution, that relative to the material for lining the converting vessel was a most difficult and important one. The requisites for a good lining appeared to me to be these:

1. It should at the outset be of a plastic or semi-plastic nature, to facilitate its solid compression between the brickwork in the converter and a removable core.

would be necessary to submit samples of equal weight to the action of as uniform and as high a temperature as it was possible to attain, and that, the temperature being uniform, the comparative fusibility of the various materials under investigation would be measured by the relative time required to melt each specimen. The difficulty of securing a uniform temperature by the use of any kind of solid fuel appeared to be insurmountable, and I therefore decided to use some form of gas blow-pipe; but, there not being any gas works in the town, it became necessary to select some form of gaseous fuel that could be readily produced of uniform quality in the laboratory. I could think of no combustible gas that could be generated in a state of uniform purity by the means at my command as easily as hydrogen, but in order to get the highest temperature attainable by its use it was necessary to employ oxygen in connection with it. In short, I was naturally led by the character of the proposed investigations and the nature of my environment to the employment of the "oxy-hydrogen blow-pipe." But the oxy-hydrogen blow-pipe as to that date constructed was, for my purposes, defective in one particular, viz.: No form of it with which I was acquainted had any certain provision by which the two gases employed could be sent to the point of combustion in exactly their combining proportions—two volumes of hydrogen with one volume of oxygen—and unless that result was attained the temperature of the blow-pipe flame would necessarily be variable, and no two experiments could be fairly compared.

This consideration caused me to devise what I believe to be a novel method of assuring the proper combination of the two gases, and it is to this feature, as well as to the general character of the apparatus for holding them, that I now ask your attention. The two gas-holders, H, O (Fig. 8), intended respectively for hydrogen and oxygen, were made of galvanized iron. They were each strengthened by two circumferential bands of the same metal, and additional strength was given the hydrogen holder by a bolt which united the centers of its ends. The two gas-holders were of the same height, but their respective diameters were such that the area of a cross-section of H was twice that of a similar section of O.

The gas-holders stand upon the cover of a shallow cistern, C, which, when the apparatus is in use, is filled with water. The gas-holders were supplied with water from an elevated reservoir by pipes, P, P', which, passing air-tight through their tops, extended nearly to their bottoms. The rate of admission of the water to each gas holder was adjusted by the valves I, I'; its function was to expel the gas from the holders through the small rubber tubes H', O' attached to the regulating valves X, X'. Each of the gas-holders was provided with a glass water-gauge tube, T, T', having valves, a, a', b, b', by closing which communication between each tube and the interior of the gas-holder to which it was attached could be cut off. Near the bottom of the gas-holders were located two cocks, V, V' and Y, Y', each of the latter having attached short pieces of tubing, which extended nearly to the bottom of the water in the cistern C before named. This cistern is provided with a tubular overflow plug Z, which, when in place, determined the maximum depth of water in the cistern, and by the removal of which the cistern could be emptied.

Before describing the operation of the apparatus I will explain the method by which the holders were filled with gas, and for that purpose will ask you to suppose that we are about to fill the holder H with hydrogen. We first uncouple the rubber tube H' from the valve x, which we then open, as also the valves a and b, and make sure that the cocks V and Y are closed; we then open the valve I and allow the water to fill the gas-holder, the air in which being expelled at the open valve x', but as soon as the water manifests itself at that valve it is closed, as also the valve I. The air having thus been expelled and the gas-holder filled with water, we now couple to the cock V one end of an iron pipe, whose other end is connected with the apparatus for generating the gas, care being taken that some point in this pipe is considerably higher than the top of the gas holder. All the connections being properly made and the generator at work, we open the cocks V and Y, and as the gas enters the holder it displaces the water therein, which finds an exit through the cock Y into the cistern C, and finally over the top of the tubular plug Z into the drain-pipe, in which the plug is inserted; thus a certain depth of water is maintained in the cistern C, and as the pipe attached to the cock Y extends nearly to the bottom of this water, all air is prevented from entering the gas-holder during the process of filling it with gas. The rate at which the gas enters the holder is indicated by the descent of the water in the glass tube T, and the final completion of the filling process by bubbles of gas rising through the water in the cistern C, from the lower end of the tubular extension of the cock Y; when these bubbles make their appearance the cocks V and Y are closed, the iron-pipe connection to the gas generator disconnected, and after coupling the rubber tube H' to the valve x the gas-holder H is ready for use. The gas-holder O is filled in the same manner with oxygen.

When this apparatus is used we proceed as follows: The valves I I' are opened to their fullest extent in order to equalize the pressure. (Continued on Page 5.)

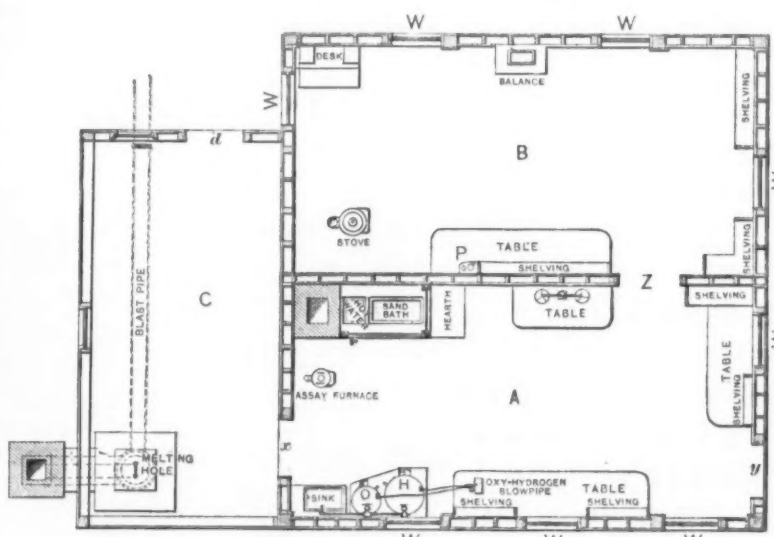


Fig. 1.—Plan of Laboratory.

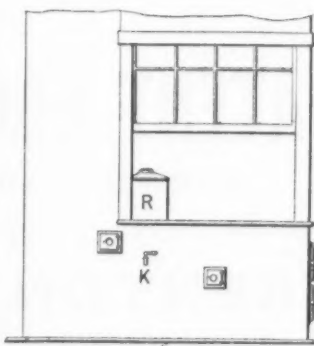


Fig. 2.—Side Elevation of Sand Bath Furnace.



Fig. 4.—Plan.

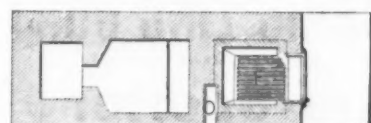


Fig. 5.—Section C D.



Fig. 3.—End Elevation.

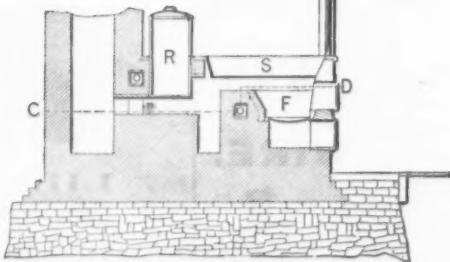


Fig. 6.—Section A B.

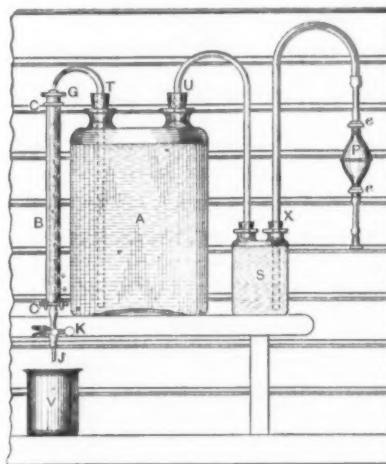


Fig. 7.—Titration Apparatus.

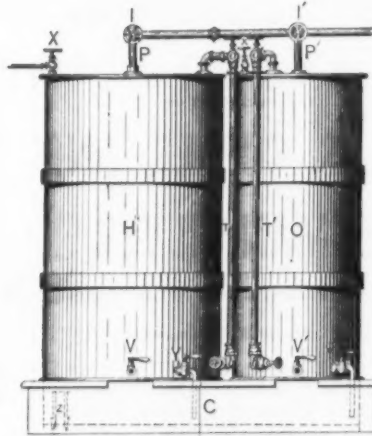


Fig. 8.—Elevation of Gas-Holders.

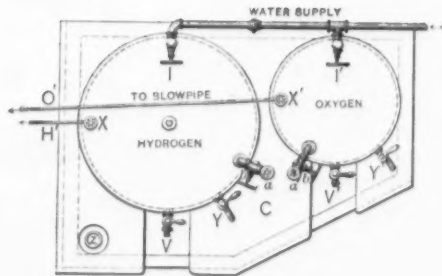


Fig. 9.—Top View of Gas-Holders.

CHEMICAL LABORATORY ERECTED AT WYANDOTTE, MICH., IN 1863.

The sand-bath furnace was located in one corner of the room A (Fig. 1). Its construction is illustrated in Figs. 2, 3, 4, 5 and 6. The basin S for holding the sand was made of wrought iron, $\frac{1}{4}$ inch in thickness. The water in the copper reservoir R was kept at or near the boiling point by the waste heat from the fire at F. The reservoir was provided with a cock, K, for drawing off its contents. Two drying ovens, O, of copper were imbedded in the brickwork. The inclosed space above the sand bath was provided with weighted sashes on its front and right-hand end, and was ventilated at its top by an opening into the chimney flue. This construction of sand bath was found to be very convenient.

The permanganate of potassa apparatus is illustrated in Fig. 7. Though the same in principle, it is not of the precise construction as that used at Wyandotte, but contains some improvements, the result of experience, which render it more substantial and convenient. The apparatus consists of a large two-necked bottle, A, for holding the permanganate solution, to the left-hand neck of which is adapted a glass tube, T, which extends nearly to the bottom of the bottle, its upper end being tapered and curved so that its extremity is directly above the cen-

ter of the upper end of the graduated "burette" B. This "burette" is supported by the clamps C, C, from which it can readily be removed for cleaning; its lower end is provided with a pinch-cock, K, having a glass adjutage, J. When the apparatus is not in use there is a piece of plate glass, G, interposed between the top of the "burette" B and the outer end of the tube T; this effectively prevents dust from entering either the "burette" or the tube. To the right-hand neck of the bottle A is fitted a tube, U, whose inner end communicates with the space above the solution in the bottle, and after passing through the cork, it descends perpendicularly, and passes through the cork in the left-hand neck of the small two-necked bottle S, into the space above the concentrated sulphuric acid, with which the bottle is nearly filled. The right-hand

neck of this bottle has adapted to it a glass tube, X, whose inner end passes nearly to the bottom of the bottle, outside of which the tube ascends to about the level of the top of the bottle A, and then by a semicircular curve to the right it reaches the upper end of the air pump P, which is supported by a couple of screw-eyes, e, e, at such a distance from the wainscoting as to admit of the hand readily grasping the bulb of the pump. When we wish to fill the "burette" with the permanganate solution we proceed as follows: The glass plate G is removed, and the air pump P is worked, thus forcing air, by way of the tube X, into and through the concentrated sulphuric acid in the bottle S; this acid arrests all the moisture and organic matter in the air, which then passes through the tube U into the space above the permanganate solution in the bottle A; as the pressure increases the permanganate rises in the tube T, and finally runs into the "burette" in a stream whose flow is easily controlled by the more or less rapid working of the air pump P; in fact, as the level of the solution in the "burette" approaches the zero of its graduation, the stream can be made to resolve itself into a series of rapidly succeeding drops, which can be promptly arrested by stopping the action of

2. Its composition should be such as to admit of its being baked in place into a solid mass.

3. This mass should have sufficient cohesion to resist the mechanical erosive action of the turbulent fluid metal in the converter.

4. The lining should be able to withstand an exceedingly high temperature for a prolonged period without melting.

5. It should oppose a maximum resistance to the fluxing action of the highly heated metallic oxides and other impurities in the converter.

Experimenting in the converter with materials for linings I was sure would be very expensive, and, in the event of frequent failures, discouraging; it was, therefore, desirable to have as little of this as possible, and, with a view of throwing all obtainable light upon the question, I determined to institute a series of experiments on materials for converter linings in the laboratory. It was clearly possible to bake in a melting pot or a reverberatory furnace small bricks or balls of any combination of refractory materials, and these could be compared as to their friability and fusibility. It was evident that, in order to correctly compare the fusibility of the various combinations, it

* Read at the Troy meeting (October, 1888) of the American Institute of Mining Engineers.

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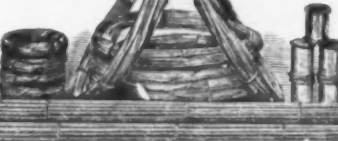
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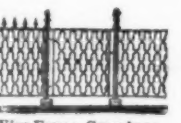
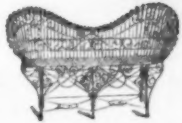
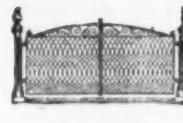

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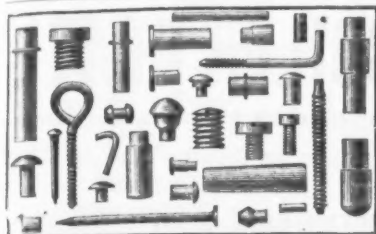
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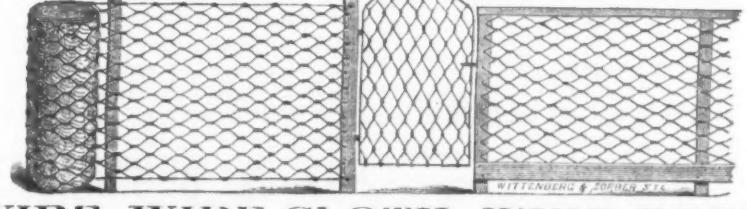
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(Continued from Page 1.)

ure in the two gas-holders, the rubber tubes H' O' are connected with the blow-pipe, the valve X is partly opened and the jet of hydrogen issuing from the blow-pipe is ignited. The valve x' is then opened and so adjusted that the water rises in the gauge tube T at the same rate as in the tube T', and when the water in these tubes rises with a uniform velocity the two gases combine at the blow-pipe in the proportion of two volumes of hydrogen and one of oxygen, giving the maximum heat for the gas consumed, but it is evident that as the amount of heat developed in a given time will be proportioned to the gas consumed in that time, it is necessary to so adjust the valves x and x' that the same amount of gas is always consumed in a unit of time, for unless this was accomplished no correct comparison of the fusibility of the several samples of refractory material under examination could be made. The samples of refractory materials to be tested were placed in a shallow cavity cut in a fire-brick; this was surrounded with pieces of brick or tile to prevent access of currents of cold air.

The apparatus was found to give consistent results when repeatedly employed on samples of the same material, rounding of sharp corners, softening and fusion occurring after the lapse of practically the same time. It is advisable to bring the samples to a red heat in a crucible before subjecting them to the action of the blow-pipe. This oxy-hydrogen blow-pipe apparatus was constructed during the year 1864, but, owing to my time being occupied with more imperative matters, very little work was done with it, and what there was done had not that continuity from day to day which is always desirable in such investigations, and before I had sufficient leisure to give myself entirely to them, circumstances occurred which rendered such studies impossible in that locality. But before speaking further of these circumstances I will say a few words relative to the work actually accomplished in the laboratory. Numerous analyses of ores were made by Dr. S. P. Duffield, who for a time acted as chemist after the resignation of Mr. Schalk. Analytical work was undertaken by some whose zeal for the subtleties of science outran their knowledge of material things. One young gentleman reported to me that a sample of 3/4-inch round steel, sent me from England, and which was so mild that it was bent cold upon itself without crack, contained "7 per cent. of carbon," and insisted that, as he had "been unusually careful in his work," he must be correct. The same party, with a positiveness that would have carried conviction to a mind unacquainted with the possibilities of the case, assured me that it was "impossible to reduce iron ore in a crucible in the pot furnace," and proposed that I should erect a "miniature blast furnace, in order that the ore should be smelted under the same conditions as obtained in the large furnaces," and on my declining to do this, and actually reducing iron ore in the way he had pronounced impossible, he declared that a small blast furnace was "better, any way," and subsequently, in another community, he erected one at his own expense, only to find that it required 60 hours of continuous hard work to obtain two pigs of iron of the size of my forefinger.

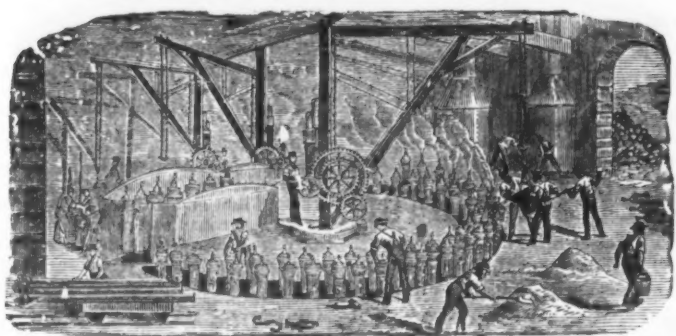
Two of my assistants (one of the pair called himself a chemist) entered into an inventive conspiracy and induced the late Capt. E. B. Ward to furnish the money for certain experiments by which they were certain to demonstrate that the large blowing engine I was erecting was entirely unnecessary, their argument being that all that was required to convert cast iron into steel was the forcing of abundant oxygen through it when melted, and, as water contained a large proportion of oxygen, the substitution of steam taken directly from the boiler for atmospheric air under pressure would greatly simplify and cheapen the process. The Captain was cautioned not to consult me in regard to the matter, as I would be sure to condemn the idea, in which statement they were quite right. These experiments were privately conducted in Detroit, and resulted in the loss of the Captain's money and the reputation of the experimenters at the same time. One of the last-named parties (not the chemist) asked what "that stuff in that little cup in the balance case was for?" I briefly explained that it was "to absorb the moisture from the air in the case and so prevent the corrosion of the steel parts of the balance." This was made a note of, and in a few days the young gentleman took some of the "stuff" to a young lady who had just received a present of a very valuable piano, and advised her to "put it in a saucer and place it in the piano to prevent the strings from rusting." This advice was followed and resulted in the simultaneous ruin of the instrument and the popularity of the young gentleman.

One enthusiast who firmly believed that the result of an analysis was inevitably a realization of St. Paul's idea of faith, "the substance of things hoped for and the evidence of things not seen," at the particular request of the late Captain Ward did something which he called an "analytical examination" to a sample of coal. His report was so favorable as to its manifold good qualities that the Captain purchased the mine from whence it came, only to find, after a large expenditure for pumping machinery, coal cars, men's houses and other plant, that there was not enough of this good coal in the mine or on the property to pay for working; hence lawsuits, tribulation and sorrow. In justice to myself I will say that none of the parties whose antics I have incompletely described were of my selection; they were thrust upon me, and I was obliged to make what use I could of them.

But let us now turn to some of the more serious and effective work accomplished by the laboratory. Some time in the year 1864, in conversation with the late Capt. E. B. Ward, relative to the economies possible in the manufacture of iron, I spoke of the fact that all the cinder resulting from the puddling of Lake Superior pig with Lake Champlain magnetic ore as "fettling" in his Wandotte rolling mill was thrown away, instead of being utilized in the blast furnaces. "Why," exclaimed the Captain, "Herr Unkunde Unheilschwanger (then a leading metallurgical authority in Wyau-

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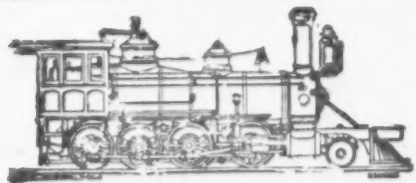
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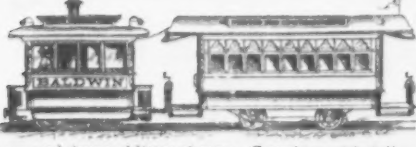
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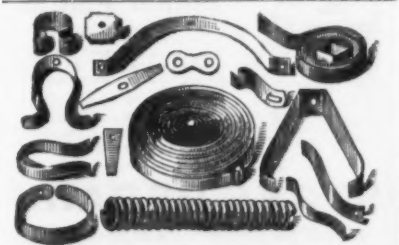
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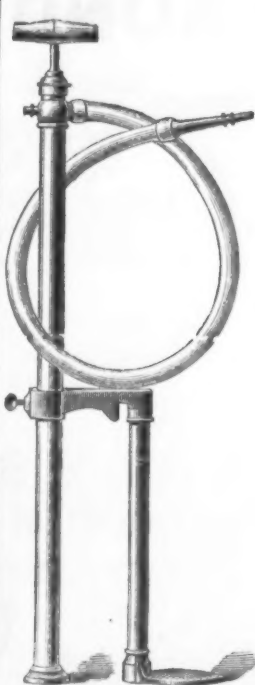
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dotte) says there is no iron in the cinder." To my reply that there was "over 50 per cent. of good iron in it," he expressed a wish to "see some iron that was made from that cinder." I assured him that he should, and a day or two thereafter I placed in his hands a "button" of iron nearly as large as the palm of my hand, representing 55 per cent. of the cinder from which it was smelted in the pot furnace of the laboratory. The Captain was not only surprised, but annoyed, at the evidence of waste in the past—a waste that could be counted high among the thousands of dollars, and he immediately gave orders to Herr Unkünde Unheilschwanger to see that this cinder was used in the blast furnaces; but so alarmed was this worthy at the possibility of what he called "bungling up" the furnace that he carried out his orders by at first charging 10 pounds of cinder with 400 pounds of Lake Superior ore, and as no harm resulted from this homeopathic dose, his confidence increased gradually, as he slowly augmented the proportion of cinder, until, after several months of anxiety, doubt and fear, he arrived at what he regarded as an almost dangerous proportion—40 pounds of Lake ore. I believe this was the largest proportion of cinder used at that time, and recently I have been authoritatively informed that as soon as I had left the vicinity the use of cinder in the blast furnace was discontinued, and it was thrown away as before. While I was engaged in experimental work with the oxy-hydrogen blow-pipe, a circumstance occurred which is a fair illustration of the malicious character of the antagonistic feeling that existed in the community relative to the laboratory and all that were connected with the new enterprise. One morning, on attempting to put the blow-pipe in operation, to my surprise, after burning a short time the flame was extinguished, and, what astonished me still more, I could not relight it. On examination I found that the water-pipe had been disconnected, and a tightly-fitting wooden plug had been driven into it; the pipe had then been recoupled, so that to all appearance everything was in good working order. Whether the scoundrel who inserted that plug and simply mischief or murder in his heart has not yet been revealed. Soon after this occurrence, in the month of January, 1865, on my return from a short absence, I entered the laboratory only to find naked walls; everything removable had been taken away; not so much as a test tube remained to show that chemical work had ever been done in the building. Herr Unkünde Unheilschwanger and kindred spirits had at last accomplished that for which they had so long labored. "Durfee's" apothecary shop, as it had been derisively called, had ceased to exist.

At the act of vandalism which I have described I manifested no surprise; of it I made no complaint; but, then and there, I mentally resolved that as soon as the first rail was rolled from steel made at Wyandotte I would leave a community which had afforded me so many painful illustrations of the potential verity of the lines of Grey:

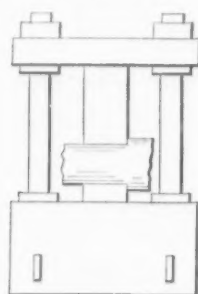
"Where ignorance is bliss

'Tis folly to be wise."

The value of any particular mechanism or method of procedure may be fairly measured by the frequency of its use; and retrospectively contemplating the ever-increasing proportions of our metallurgical industries, reflecting upon the enormous aggregate of their present annual production, and remembering that these splendid results are but the crystallization of the intelligent thought of skillful men from among our engineers, metallurgists and chemists, I find my justification for the chemical work undertaken at Wyandotte in the fact that to day, in every well-ordered establishment for the manufacture of metals, the laboratory is considered an indispensable adjunct, and Science, represented by the engineer and chemist, stands at the right hand of Labor, advising, guiding, directing and controlling its every movement.

Notes on Hydraulic Work, &c.

An important objection to the use of the hydraulic press is the fact that its operation must be intermittent, the effect due to the pressure exerted being such that for the instant the work under treatment must usually be held absolutely at rest. Hence it follows that if a pressure must be exerted a second time upon the same spot the press must be backed and brought up again, with a repetition of the whole operation for each separate effort. In some classes of apparatus the machine tools, for example, of which quite a large variety have already been proposed and executed, these successive motions can be made with considerable rapidity, thus rendering



Notes on Hydraulic Work, &c.—Fig. 1.—Hydraulic Press, Very Heavy Pressure, with Low Velocity of Motion of Ram.

the tools quite available for an important and growing field of operations. These quick-moving tools or presses, of which the riveting machine may be taken as the type, usually are worked under a very heavy pressure (from 1500 to 2500 pounds per square inch), so that for the work which they must do the parts of the machine—the ram upon which the pressure acts and the links or other parts of the framing—may be comparatively light. For some purposes the slow movement of the parts of the press, when successive strokes must be made upon the same piece of work, is a matter of small importance, or, in other words, the nature of the work is such that even at the best it

can be done only very slowly, and hence, if a good deal of it must be performed, several machines or presses must necessarily be provided, and thus only the whole requirement of production can be met.

The steam hammer is the antitype, or high-speed associate or kinsman, of the hydraulic press, the resemblance which may justly be traced between them being, really, very close in respect of their methods of working, the duty of one being performed by a very high pressure upon comparatively small and slow-moving parts, which owe nothing in the effect produced to the velocity of the parts in motion, while the other works under a moderate pressure and with high velocities of actual impact. Thus, the result produced in one case can be likened to the other in kind only, for they differ very widely in degree.

The modern rolling mill, as applied to metals, is an illustration of the most striking kind of the development and perfecting of the primitive idea of the use of pressure and of blows for the changing of the shape of the material which must be wrought. By the use of this type of machinery a press-

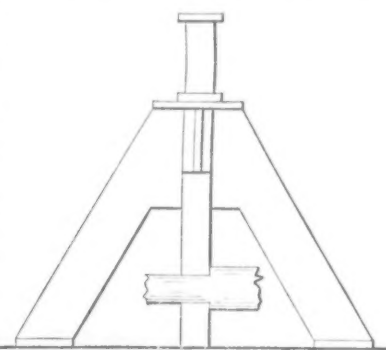


Fig. 2.—Steam Hammer, Moderate or Low Pressure, with High Velocity of Motion of Head.

ure can be brought to bear upon the metal under treatment which is limited only by the strength of the massive parts of the machine. At the same time, also, and continuously, a motion through or between the rolls can be imparted to and maintained with the material such as shall insure the working or the compression and extension in length of the metal, at a speed which, in the modern and fully-equipped rolling-mill, is surprising and almost incredible. The fact that the action of the rolls is the same in kind as that of the hammer or the press may be illustrated by comparing the working of the perfect mill with that of one in which the rolls, instead of being finished in true circles, are made with a limited number of flat sides, so that the cross-section shall be a polygon of six or more sides. If the usual motion be then imparted to these polygonal rolls, the material, in passing between

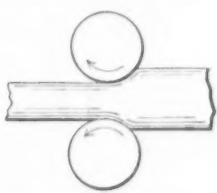


Fig. 3.—Rolling Mill, Very Heavy Pressure, with Rapid Motion of Bar Between the Rolls.

them, would be compressed or worked upon by the high corners of the polygons, and would be pushed forward by a series of impulses, more like the blows of a circular hammer or press, if such a tool can be imagined, than anything else which can be named.

It is quite evident that no machine could be made to endure for more than a very short time the shocks due to such an outline of rolls after the piece under treatment had become somewhat cooled, and thus more dense and difficult to work, although for some kinds of material the grooves in the rolls for the earlier and easier part of the rolling are "roughed" to such an extent as to render them approximately polygonal in outline. The use, on the other hand, of the ordinary smooth roll leaves very little indeed to be desired in this part of the machinery

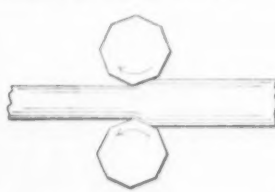


Fig. 4.—Rolling Mill, Assumed Polygon Outline of Rolls.

for the manufacture of metals, so far as the production of a maximum output with a minimum of wear and tear and of cost for labor is concerned.

Fig. 1 shows a skeleton outline of a hydraulic press, although it has very rarely been used for working iron on any important scale. Fig. 2 is the common form of hammer used for the heavier kinds of forging, and the drawing out of plain bars such as compare most closely with the usual work of the rolling mill. Fig. 3 is a section of the rolls as commonly used in the simple forms of work. Fig. 4 is an outline of the polygonal rolls referred to, which, for the ordinary work of the mill, would be wholly inadmissible. Nevertheless, they illustrate clearly the resemblance in kind between the working of the hammer and the simple cylindrical rolls.

In all the best rolling-mill machinery the question of speed of operation has received the closest attention, and it has been stimulated to a limit which even at the present moment is almost incredible, and which only eight or ten years ago would have been deemed utterly impracticable. In a word, it has thus been found possible to combine in the working of one machine, and in one operation, the intense pressure of the hydraulic

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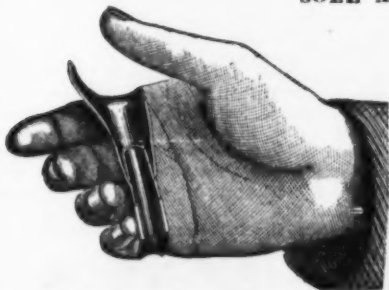
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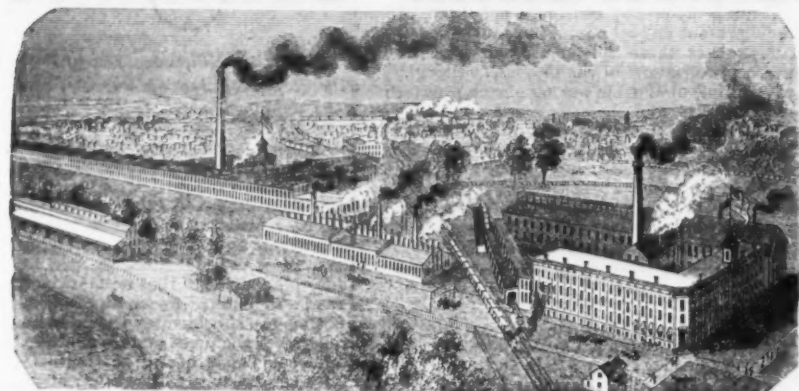
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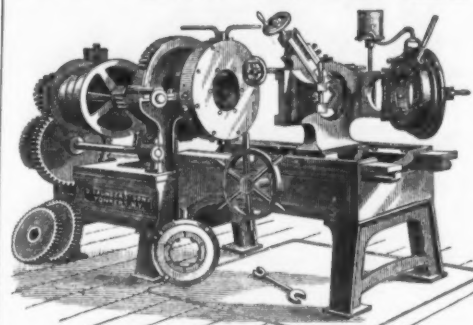
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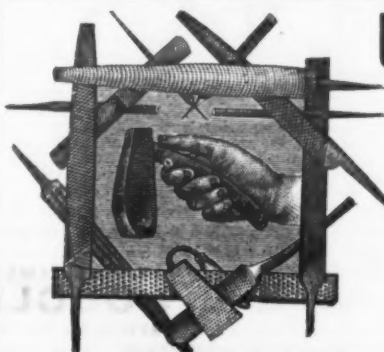


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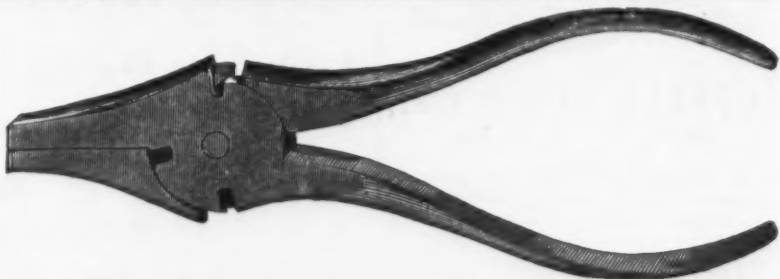
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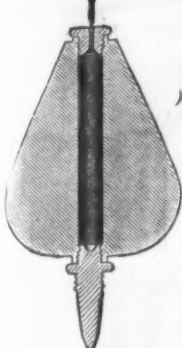
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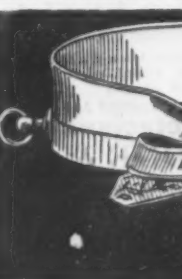


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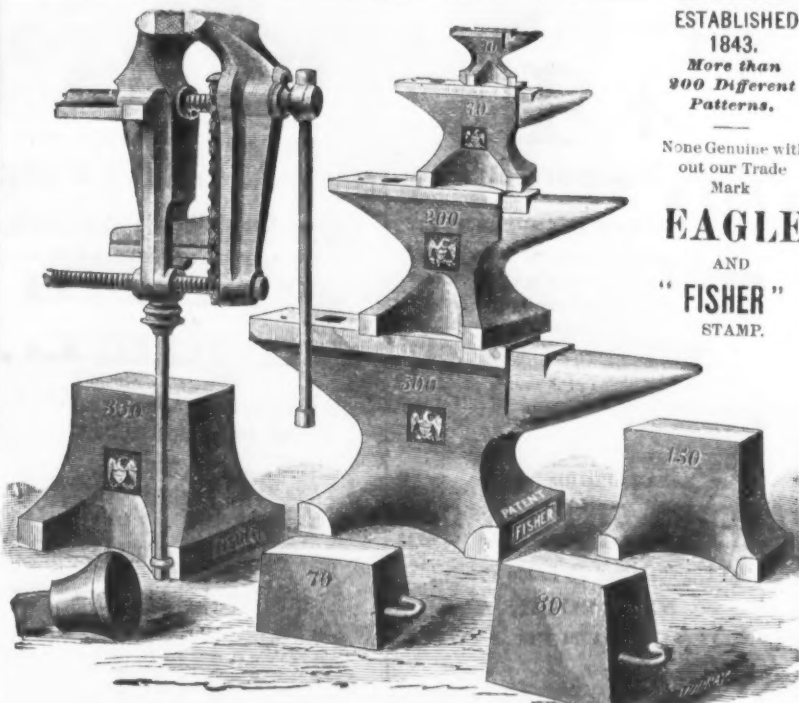


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Communications by letter will receive prompt attention.
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press, the high velocity of motion of the steam-hammer and the rapid linear motion of the bar, thus securing the needed effect of the shaping of the bars or plates of which so large a proportion of the whole production of iron and steel is made up. For very obvious reasons, this improved method of the rolling-mill type of working, as it may be called, which in its essential idea dates back many years, has so very greatly cheapened the cost of iron and steel bars that they are used in a thousand-fold more ways and places than they possibly could have been used if made only under the hammer, as in limited amounts they were made many years ago. It is evident that by the substitution of the continuous pressure of the rolls of the rolling mill upon the bar or plate—for, in other words, the quick succession of blows at extremely small intervals of time—for the slower movement of the ordinary hammer, however fast it runs, an important relief would be sure to be found from the wear and breakage of parts, due to the constant blows of inelastic bodies like the head and anvil of the ordinary hammer. This relief was probably more striking in the earlier days of iron-making than at the present time, for the hammers now built for such work are much stronger and more correctly proportioned in all their parts than those were with which the early rolling mills came at once into competition. Hence a far less wear and tear is experienced in the working of modern high-class steam hammers, even when run to their utmost capacity, although the hammer, as an implement for rapid production, was left hopelessly in the rear, even by the weak and comparatively trifling rolling mills in use a generation or more ago.

It is worthy of note, too, that the nature of the material and of all these methods of working in the high-speed rolling mill are such that the element of speed, and its strict maintenance, is one of vital importance. This work—the proper reduction in the area of the bar as it becomes extended in length—is such that it must be done at this high speed or it cannot be done at all. These rigid requirements of the rolling-mill service have led to improvements in the design and construction of the rolling-mill engine which are more striking in their kind, probably, than any yet introduced into the slower-moving machines referred to in this connection, and are probably more ingenious than the simpler movements of these older machines will ever call for. These engine improvements, so far as they have been made really successful, have been kept very closely along the line of the greatest simplicity and most massive strength of parts.

Bench Power Press for Extra High Work.

Among the presses manufactured by the Ferracute Machine Company, of Bridgeton, N. J., and illustrated in their new catalogue, is a power bench press which is noticeable for its simple construction. Referring to the annexed cut, it will be seen that the slide-bearings are cylindrical, the slide-bar consisting of only three pieces, viz.: The upper bar, which is also an eccentric strap and pit-man combined; the lower bar, which is adjusted up or down by being screwed into the upper bar, and a lock-nut, which locks the two together. This construction limits the press to the production of round work.

The shaft is provided with an automatic clutch, attached by a chain to a treadle on the floor, so arranged that a pressure of the foot causes a part of the clutch to come into connection with the revolving fly-wheel and make one revolution. Continuous strokes are made by locking down the treadle. An eccentric keyed to the shaft gives motion to the slide-bar, and an adjustable spring brake at the end of the shaft regulates the action of the clutch. The bottom end of the slide-bar is a greater distance from the bed of the press than usual, thus adapting it for taller work than will go in an ordinary press. Work for which this press is especially adapted is flaring or closing in the ends of cans, flaring or spreading can bodies, curling or wiring cups, cans, pans and other articles of tinware. It is not adapted for cutting dies.

The dimensions, &c., of the press are as follows: Height from bench to top of fly-wheel, 45 inches; distance back from center of slide-bar, 4 inches; height from bed to slide-bar, when up, 13 inches; stroke of slide-bar, 1 1/2 inches; adjustment of slide-bar, 3 1/2 inches; diameter of fly-wheel, 18 inches; width of fly-wheel, 3 inches; weight of fly-wheel, about 75 pounds. The weight of the whole machine is about 350 pounds.

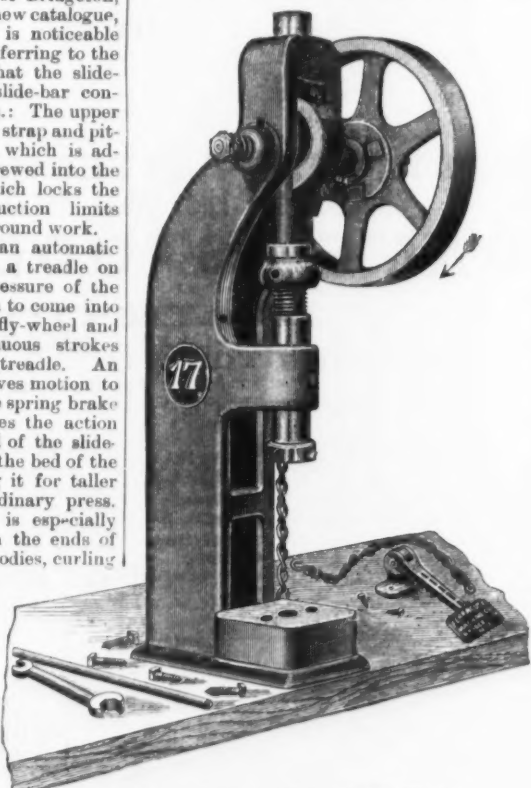
Shipbuilding on the Pacific Coast.—The San Francisco Bulletin says: "There is a prospect that an extensive shipbuilding yard will be established at South San Francisco for the construction of iron and steel ships and steamers. The parties interested are the proprietors of the Union Iron Works, consisting of George W. Prescott, H. W. Scott, Irving M. Scott, George W. Dickie and J. O'B. Gunn. The yards will be established on the Potrero, on the south side of the Central Basin, and will have a frontage of 1100 feet. There will also be moved the Union Iron Works, this establishment to be included in the shipyard plant. The whole will occupy 16 acres of land, and will adjoin the extensive dry-docks reported soon to be constructed by an English company. The plans show that there are to be several extensive buildings, of which the boiler maker's shop will be 200 feet deep by 90 in width. In this there will be a traveling crane with a 55-foot span and 35-foot lift. The smiths' shop will be 40 feet front by 200 deep. The pattern shop will be 50 feet front by 150 deep, and adjoining will be the supply shop, the dimensions of which will be 50 by 50 feet. The foundry on the right will be 90 by 200 feet, in which will be a traveling crane with 50 feet span and 25-foot lift. The core room is 40 by 40 feet, and the brass foundry and coppersmiths' shop 40 by 45 feet. The machine and erecting shops each will be

40 by 200 feet, in which will be a traveling crane with 40-foot span and 25-foot lift. Next to this is the machine shop, 40 by 200 feet, and the erecting shops, 55 by 200 feet. The traveling crane here has a 55-foot span and a 35-foot lift. Adjoining will be a machine shop, 40 by 130 feet, and in the front of which will be situated the company's offices, occupying a space of 40 by 70 feet. From the works will run out two railroad tracks to a wharf on one side and on the other to the dry-dock. Mr. Scott states that the company are in earnest, and intimates that they may be ready to take contracts early next year."

Corroded Wire Cables.

The Pittsburgh Telegraph says: "The Suspension Bridge, that link between the sister cities which is traveled by hundreds of thousands of people weekly, has been in such a state of commo ion, owing to the repairs being made upon it, that people have complained and growled at the inconvenience occasioned, and some of the papers have even said that the directors have been spending the money in order to cut down the reserve fund—all of which is an injustice to the bridge company in this instance. The work on the bridge is under the care of Mr. F. Collingwood, an old and experienced engineer, sent out by Colonel Roebling, who built the bridge and is a large stockholder in it. It is 24 years since the bridge was built, and in all that time the moorings of the cables have not been repaired to any great extent. Colonel Roebling thought it would be well to examine the wires and see what condition they were in, and it is well that such scrutiny took place, for the bridge was in danger of being ruined by the sagging and even by the breaking of the cables. The large cables, which are 7 1/2 inches in diameter, were closely surrounded at the moorings on each end by masonry which was concreted closely around the wires. Before the cables were so surrounded they were covered with a preparation of boiled tar. Tar was once supposed to be an admirable protector of iron, but this belief was exploded long ago, and the result in the present case illustrates how injurious it is. The tar gradually, through atmospheric influences, changed into tar water, and this water was rapidly ruining the wire. The water contained chloride, carbonate and other salts of ammonia, which ate the iron. Some pieces of wire were dotted with little holes like small-pox pits, where the rust had gnawed away the material, and when the wires were uncovered and a strain put upon them they snapped like straws. Although each of the 1/2-inch wires should stand a strain of over 1200 pounds, they broke at 200.

As soon as this state of affairs was discovered Mr. Collingwood began to scrape the tar off and carefully overhaul each cable. Whenever a defective piece was found it was cut out and a new piece spliced in. The



Bench Power Press for Extra High Work.

splicing was a delicate and difficult piece of work. It is easy enough to join the ends together, but it is not so easy to get just the right strain on the new piece. There must be no slack wires in the cable, of course, so each splice is put in with a grip machine, and the amount of strain is kept uniform by delicate tests. In one large cable 175 wires had to be spliced, in another 31, in another 71, 5 in another and 31 in another, and 3 are not yet examined. It is very tedious work scraping each wire, as only a few men can work at a time. There are 600 of these wires in the big cables and 200 in the small ones, so that the amount of work can readily be seen. After the wires are scraped they are covered with a coating of linseed-oil, which is allowed to dry, and a thorough application of white lead is given. Then the wires are drawn together by bands of small wire 7 inches apart, and the wrapping goes on. The wrapping consists of wire 1/2 inch thick, and it takes 300 feet of this wire to a foot of cable. A coat of ordinary white lead and coloring finishes the work. One mistake made in building the bridge was in putting the masonry around the cables at the moorings so that they could not be examined. The masonry has been all removed, and a brick tunnel built, which is watertight and is provided with iron water sheds and covered by iron plates, which can be lifted when it is necessary to repaint or repair the cables in future. Where the cables pass through the woodwork, holes have been made so that all parts of the big wire can be reached at any time. Mr. Collingwood says that it takes 10 per cent. yearly

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JOHN WILSON'S
BUTCHERS' KNIVES,
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TRADE MARK



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ACKNOWLEDGMENT AND AGREEMENT.
"WHEREAS, I, GEORGE A. ROBINSON, of West Mansfield, County of Bristol, State of Massachusetts, have heretofore manufactured and sold certain Knives bearing a Mark which is claimed to be an imitation of the trade-mark owned by John Wilson, of Sheffield, England, which consists of four peppercorns and a diamond, under the mistaken belief that I had the right to do so.

NOW, This, is to Witness, that, in consideration of the forbearance of the Representatives of the said John Wilson to sue me for damages for the wrong aforesaid, I do hereby undertake and agree,
FIRST, to surrender and deliver to the Attorneys for the said John Wilson, all knives now on hand, and in my possession, or under my control, bearing the said imitation trade-mark, and
SECOND, I further undertake and agree to and with the said John Wilson, and his legal representatives, not to manufacture or sell, or cause to be manufactured or sold, at any time in the future, Knives or other Cutlery, bearing his trade-mark aforesaid, or any imitation or simulation thereof. IN WITNESS WHEREOF, I have hereunto set my hand and seal at West Mansfield, aforesaid, this thirty-first day of May, 1893.

WITNESS—
E. M. REED,
(Attorney for Defendant.)

Imitation

JOHN WILSON
SHEARSTEEL

G. A. ROBINSON. (L.S.)

WORKS:—SYCAMORE ST., SHEFFIELD, ENGLAND. Established 1750.

AMERICAN MADE RAZORS



J. R. TORREY,
MANUFACTURER OF
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In All Styles.

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MANUFACTURERS OF
RAZORS.

To introduce, we offer **HOLLOW GROUND RAZORS** at \$1.50, \$1.75, \$2.00, \$2.50. Our **SWEDISH GEN RAZOR**, \$1.75, \$2.00, \$2.50. All our own make, and warranted the best cutters in the world. As Razor makers we know what is needed to sharpen a dull razor, and will mail for 75 cents a Strop warranted to set a fine edge to any razor. If in morocco case, \$1.00. Factories at Worcester, Mass. Catalogues to the trade.

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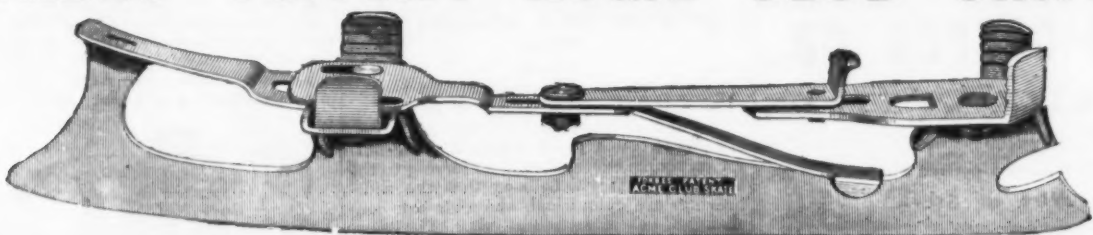
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FORBES' PATENT ACME CLUB SKATE.



UNIVERSALLY ACKNOWLEDGED THE
BEST SELF-FASTENING SKATE EVER INVENTED.
Retains the First Place and Foremost Rank for Demonstrated Superiority.

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For Sale by all the Principal Dealers.

GEO. H. CREED,
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Manufacturers of and Wholesale Dealers in
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ONEIDA ALARM TILL.
SUSCEPTIBLE OF OVER 100 CHANGES.
Better than any other Till in the market. No tampering with keys, as it alarms every time a key is touched, unless acquainted with combination. Send for prices and compare this Till with others in the market. No till-tapping possible.
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For heavy bedsteads, book-cases, flower stands, refrigerators, safes, sideboards, desks, or very heavy furniture. Also for heavy ice chests, magazine boxes, stove trucks, heavy showcases, beer boxes, or any very heavy weight. Especially adapted for use in beer bottling, fruit canning, tobacco or warehouse establishments, where heavily-loaded tables need to be moved.

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The demand for Joseph Rodgers' & Sons' productions having considerably increased, they have, in order to meet it, greatly extended their Manufacturing Premises and Steam-power.
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R. & J. Linacre, Grass Hooks and Sickles,
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THREE PRIZE MEDALS.



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PARIS, 1875.

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Albion Steel Works, Sheffield,
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STEEL,

Table Knives, Razors, Shovels, &c., &c.,
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Manufacturers of

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NOTICE is hereby given to all manufacturers or dealers, that any person imitating our registered Trade Marks, or simulating the same, or dealing in goods marked in imitation of our stamps, will be duly prosecuted and held liable for damages arising from any infringement of our legal rights.

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NEW pattern Heavy Screw Clamps: strongest in the market.

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Of superior quality, and Hardware Specifications in Malleable Iron made to order.

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Burglar-Proof

SASH LOCK.

LIFTS THE WINDOW

(in locking) evenly to its place.

SIMPLE AND STRONG.

PAYSON MFG. CO.,

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PATENT PERFECTION

CENTRAL ACTION,

RAISED PILLAR

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Multiplying Reel

FLUSH BALANCE HANDLE

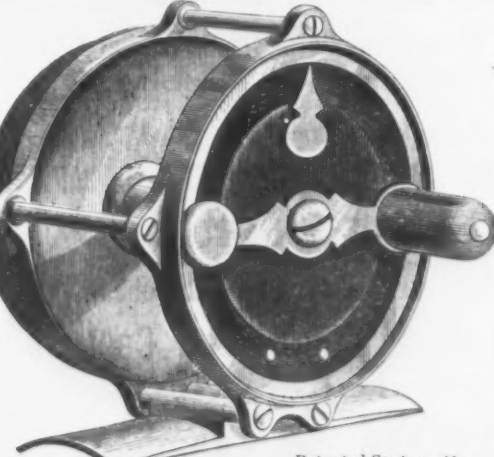
ADJUSTABLE CLICK.

Frederick Malleeson

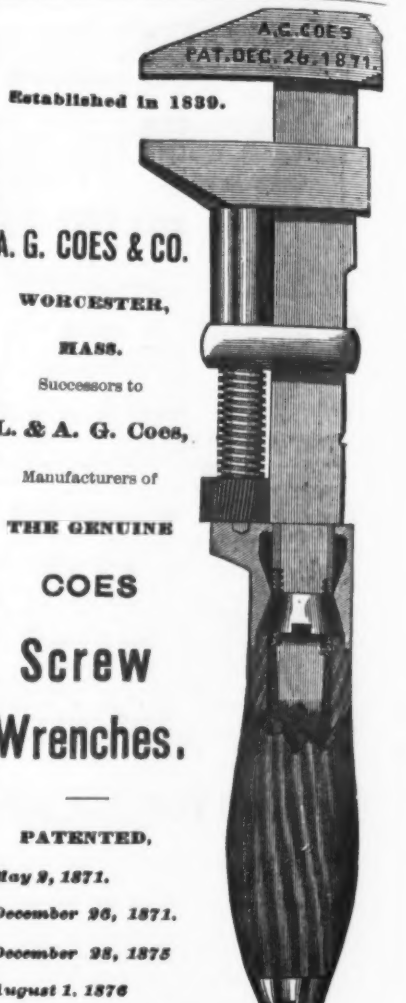
Patentee and Manufacturer,

136 to 144 First St., Brooklyn, E. D., N. Y.

Send for Illustrated Catalogue, Reels, Hooks on Gut, Files, &c. For sale by the trade generally.



Patented Sept. 4, 1883.



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Successors to

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Manufacturers of

THE GENUINE

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Screw

Wrenches.

PATENTED,

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December 30, 1871.

December 30, 1875

August 1, 1878

The backstrain when the wrench is used is borne by the bar—not by the handle.

The strongest Wrench made, and the only successful Re-enforced Bar.

None genuine unless stamped

A. G. COES & CO.

Our Agents, GRAHAM & HAINES, 113 Chamber St., New York, carry a full line of our goods, and will be pleased to serve you at factory prices.

HILL'S CHAMPION DRYER.

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SELF-FASTENING

Clothes Dryer

IN USE.

Patented in United States and Canada.

Three Sizes, 100 to 150 Feet of Line.

ALSO MANUFACTURERS OF

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For Illustration see last issue of Iron Age.

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HILL DRYER CO., Worcester, Mass.

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Unsurpassed for cheapness and durability. Unlike any other make, it combines a perfect lever principle with a blade working in a slotted steel hook. Send for illustrated circular and price list.

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Dealers' Firm Names put on when desired.

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WHOLESALE ONLY.

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Manufacturers of Leather Gun Cases, Holsters, Bags and Clothing of Leather and Duck.

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BARNES' SAWS.

Complete Outfits for Workshop Business.

Lathes for Wood or Metal, at

CHARLES E. LITTLE'S,

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Descriptive Catalogue Free.

HALL & ELTON'S GERMAN SILVER.

1837.



1883.

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HALL, ELTON & CO., Wallingford, Conn., and 47 East 13th St., New York.

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THE PARAGON.



The Most Perfect ALL CLAMP LEVER SKATE Ever Made. NO TROUBLE IN ADJUSTING.

NEAT, SIMPLE, POWERFUL AND EFFECTIVE.

In its general use at the leading Rinks and Skating Lakes last season, it invariably received the highest testimonials of favor. Yet, notwithstanding these, we have improved some points, so there cannot now be a question as to its great superiority.

WE ALSO MAKE A COMPLETE LINE OF ALL OTHER KINDS OF SKATES.

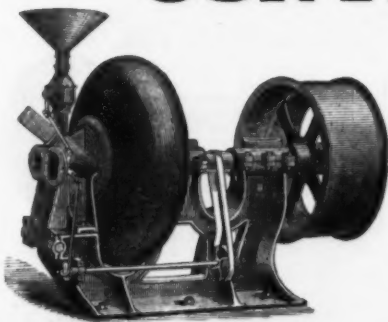
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522, 524, 526, 528 and 530 West 20th Street, - - - - - NEW YORK.

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DUK'S
Mechanical **ATOMIZER** Or
Pulverizer.

For reducing to an impalpable powder all kinds of hard and brittle substances, such as QUARTZ, EMERY, CORUNDUM, GOLD AND SILVER ORES, BARYTES, COAL, OCHRE, MANGANESE IRON ORES.

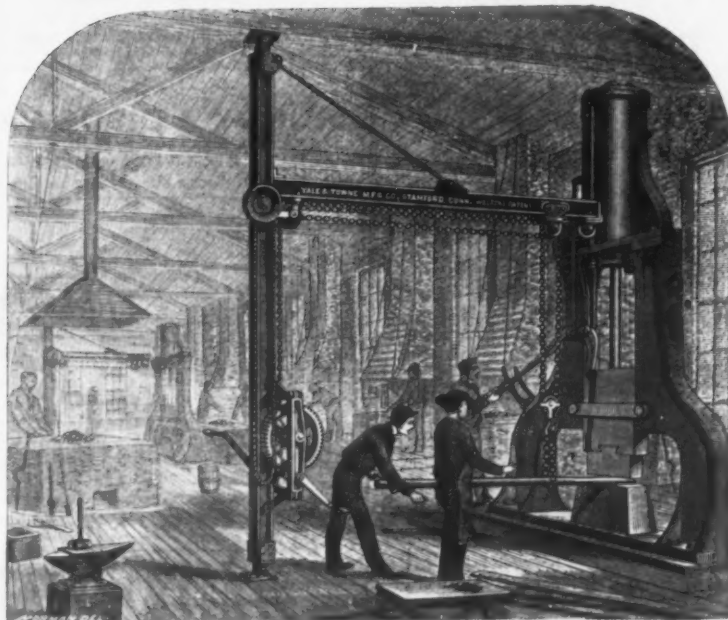
PHOSPHATE ROCK, &c.

It is simple and not liable to get out of order. Revolving Shell being constructed of Siemens-Martin steel, and all parts mechanical in design and of first-class construction. Weight, 5,500 lbs., heaviest piece, 1,500 lbs. It will pulverize 7 to 10 TONS IN 10 HOURS with 30 H. P.

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Load Always Self-Sustained.

Lifting and Lowering are effected by means of the Winch.

Can be constructed with Trolley Traversing mechanism, as in cut, or without.

In asking for estimates, give capacity, height of mast and effective radius required, and whether trolley traversing mechanism is desired.

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Just Out—A preliminary illustrated and descriptive circular, with illustrations of the various types of cranes made by us, mailed on application.

of the cost of a large bridge to keep it in good condition. The bridge has safely supported a load of 22 tons on one wagon, but the engineers advise the directors to refuse to allow more than 12-ton loads to pass over.

Wire Cloth for Lathing.

Various forms of metal have been used at different times as substitutes for wooden lath, among which may be mentioned wire-cloth, which has been extensively introduced. One of the chief claims of this material to favor is that by its use wooden buildings can be rendered practically fire-proof. Cast and wrought iron beams and columns in building construction, unless they are thoroughly protected from the action of fire, are not to be depended upon. A comparatively low heat renders them useless, and in many cases buildings are thrown down by the expansion of the metal and the sagging of heavily-loaded floors at a very early period after a fire breaks out. It is well known that firemen will refuse to enter an iron building for the purpose of fighting a fire, while they will contest the progress of the flames step by step in a building having wooden columns and floor beams. Since iron, to be entirely serviceable, must be incased in some non-conducting material, and since in many cases equally as satisfactory results are obtained from wood similarly protected, and withal at a much lower first cost, it follows that the use of wood in this general manner is becoming very common. One of the best protectors of wood is mortar, and, accordingly, some method by which the mortar can be held in place during the action of intense heat is a prime essential. Wire-cloth used as lathing has been demonstrated by repeated trials to be satisfactory for the purpose. The particulars of a test recently made under the supervision of Mr. O. B. Potter, of New York, on the site of the old World Building, may be of interest to our readers. A small building was erected, with walls of brick. It was covered with wooden beams, and common wood furring strips were run crosswise, to which was fastened the wire lath. Two coats of mortar were applied in the usual manner and allowed to dry. On the day appointed for the trial a very hot wood fire was kindled and kept to the highest point for two hours by frequent replenishing. The fire was then allowed to go down to facilitate investigation. It was found that the second coat of mortar, which had been artificially dried, had sealed off, but that the scratch coat was intact, not even a crack being visible. The original intention was to have ended the test at this point, but it was determined to proceed to a still severer trial. Accordingly, the fire was again built, and wood was supplied for 40 minutes longer, the fire burning on the second trial for an hour, making in all something over three hours, during which the ceiling was exposed to a more intense heat than would ordinarily be experienced in a burning building. At the end it was found that the plaster had fully protected the wooden beams, demonstrating that the employment of wire lath will serve to confine a fire to the apartment in which it originates. The manufacturers of the material thus tested, the Clinton Wire Cloth Company, of Clinton, Mass., with branch offices in New York, Boston and Chicago, hold patents for improvements which materially reduce cost. They put forward the statement that it only adds from one-tenth of 1 per cent. to 1 per cent. to the cost of a building in comparison with wood lath, while it materially reduces rates of insurance. The further claim is made for it that ceilings in which it is used will not crack, and that, therefore, it is specially adapted for fine work. We are informed that it is used in the buildings erected by the Astor and Stewart estates, and that it is employed in the Vanderbilt residences.

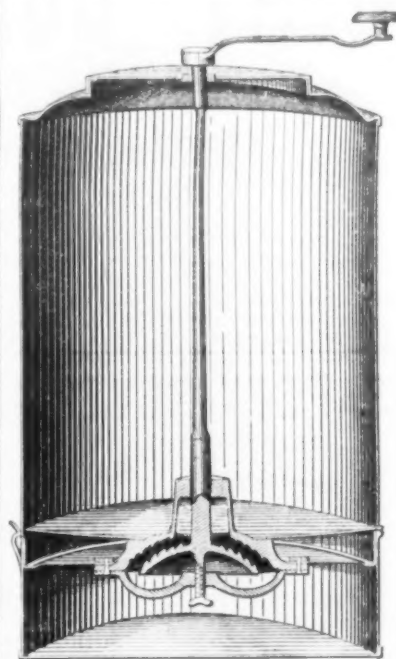
Nickel Discoveries.

It has long been known to intelligent prospectors that nickel is associated with other metals in the metalliferous veins traversing the metamorphosed granite, quartz diorite and slate belt (from three to seven miles in width) separating the quartz-porphry that skirts the volcanic valley of Mono Lake from the hornblende or cynetic granite constituting the summit of the Sierra Nevada chain, and extending from Green Creek, north to Castle Peak, to the North Fork of Rush Creek, south of Mount Lyell, a distance of 25 miles or more. Float rock carrying from 8 1/2 to 9 1/2 per cent. of nickel, \$15 to \$18 per ton in silver and a trace of gold has been found in considerable quantities on Virginia Creek, near the base of Castle Peak, and it was probably the presence of a large percentage of nickel that prevented the successful working of the rich auriferous ores of the Dunderberg mine, at the northern base of that peak, years ago. In some places along the outcrop of the Sheepherder lode of the Great Sierra Company, on Tioga Hill, 12 miles further south, where the slate has displaced the granite of the summit, and crossed diagonally over the western slope nickel, it is also found in considerable quantities; but the shaft sunk over the tunnel shows that it does not follow the vein down more than 40 feet. An occasional trace of this metal is also found in the free gold ores of this district. Andrew Thompson and John Hall have recently made a discovery on Iron (or White Wolf) Mountain, five miles south of Tioga Hill, which bids fair to prove the *vein madre* of nickel in this section. They sunk down on the solid vein about 15 feet, and cross-cut 14 feet, without finding any traces of either wall. The lode is on a gentle slope of a low slate mountain, the surface of which was polished by a glacier which moved northward from Mount Lyell and eroded the cañon or valley now occupied by the Dana Fork of Tuolumne, but this surface has since weathered until it is covered with sufficient soil to support a heavy forest of pine, and hence the outline of the lode cannot be traced on the surface, but the indications are that it is 60 feet wide. So far as the vein has been opened, the ore appears to be of very uniform grade, except a few small streaks of barren quartz, and an average sample sent to San Francisco for analysis gave a return

of 34 per cent. nickel, \$17 per ton in silver and a trace of gold. When run out by the recent storm, the owners were not aware of either the nature or value of their discovery, as they did not get returns from the assayer until they came in, but were drilling away through the "iron" in search of silver.

Combined Coffee Canister and Mill.

Messrs. Norton Bros., of 40 to 46 River street, Chicago, have a very complete line of special tin goods adapted to the grocery and hardware trade. A very neat catalogue issued by this firm, a copy of which reached us some time since, shows many goods not ordinarily kept in stores, and yet for which there is a well defined demand. Among these may be mentioned sample cases with removable pans, constructed with provisions for tags and cards, and all arranged in a very compact shape and well adapted to the special purposes for which they are intended. Our engraving shows, by means of a sectional view, a combination article belonging to the



Combined Coffee Canister and Mill.

general line of goods we have mentioned, and upon which we understand a very satisfactory trade has already been established. It may be described as a combined coffee canister and mill. Our engraving clearly shows the arrangements of the parts. The handle by which the mill is operated is loose, and after it is taken off there is no difficulty in removing the top of the can. By means of grooved projections stamped in the breast of the can and also in the rim of the cover, but reversed, the latter locks on to the former by merely turning it a slight amount. By this means the coffee is shut up in a receptacle that is practically air-tight. The adjustment of the mill is effected by means of a screw projecting from the bottom in the ordinary way. The ground coffee falls into a pan-like vessel, which is hinged to the bottom of the can and held in position when shut by a spring catch, shown at the left. Only so much coffee is ground from time to time as is required for use. The whole construction is neat and workmanlike in all respects.

The Nail Mills of the United States.

The Bulletin of the American Iron and Steel Association prints the following directory of the nail mills of the United States, compiled by Mr. James M. Swank. The information was gathered direct from the nail makers and is probably complete and accurate. The capacity of each works is given in kegs of 100 pounds:

Maine.

Pembroke Iron Works, James C. Warr, Pembroke. Number of nail machines, 30. Annual capacity, 30,000 kegs of iron and patent iron-steel nails.

Massachusetts.

East Bridgewater Iron Company, Rogers & Sheldon, East Bridgewater. Office, 81 Water street, Boston. Number of nail machines, 26. Annual capacity, 32,000 kegs of cut nails.

Fall River Iron Works, Fall River Iron Works Company, Fall River. Number of nail machines, 105. Annual capacity, 160,000 kegs of cut nails. Adding to more nail machines.

Gosnold Mills, New Bedford. Propose adding 10 nail machines to their rolling mill, to have an annual capacity of 4500 kegs of cut nails.

Mount Hope Iron Works, Somerset. Number of nail machines, 58. Annual capacity, 72,000 kegs of cut nails.

Parker Mills, Bridgewater Iron Company. Wareham. Office at Bridgewater. Number of nail machines, 69. Annual capacity, 120,000 kegs of cut nails.

Robinson Iron Company, Plymouth. Number of nail machines, 18. Annual capacity, 25,000 kegs of cut nails.

Somerset Iron Works, Old Colony Iron Company, Somerset. Office at Taunton. Number of nail machines, 70. Annual capacity, 125,000 kegs of cut nails.

Tisdale Nail Works, William E. C. Smith & Co., East Wareham. Office, 8 Oliver street, Boston. Number of nail machines, 80. Annual capacity, 70,000 kegs of cut nails. Has been idle for many years.

Tremont Nail Works, Tremont Nail Company, West Wareham. Number of nail machines, 75. Annual capacity, 100,000 kegs of patent iron-steel nails.

Wareham Nail Company, South Wareham. Number of nail machines, 33. Annual capacity, 65,000 kegs of cut nails.

Weymouth Iron Company, East Weymouth. Number of nail machines, 82. Annual capacity, 106,000 kegs of cut nails.

New York.

Albany and Rensselaer Iron and Steel Company, Troy. Number of nail machines, 45. Annual capacity, 40,000 kegs of steel nails.

H. D. SMITH & CO.,

Plantville, Conn.,

Manufacturers of the

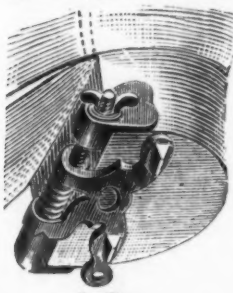
BEST QUALITY CARRIAGE MAKERS' HARDWARE,

Manufacture the Largest Variety of Forge Carriage Irons, of Best Material and Workmanship.

PRICES LOW FOR QUALITY OF WORK FURNISHED.

SEND FOR PRICE LIST.

SAFETY REVERSIBLE ICE CREEPERS.

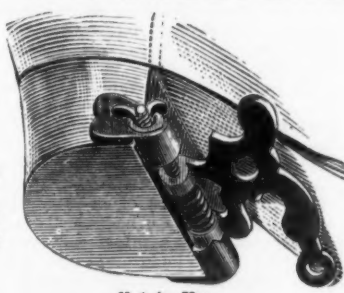


Safe.

Durable.

Cheap.

NOTHING TO TAKE
OFF WHEN ENTERING
THE HOUSE.



Not in Use.

The Only Perfect Reversible Ice Creeper. Unparalleled Success Wherever Sold.

SOLID
CAST STEEL



ICE
CREEPER.

Each Kind are Packed
Assorted Sizes.

Sample pair of either by
mail upon receipt of 60 cts.

SCOTT MANUFACTURING CO., Sole Patentees and Manufacturers,
BALTIMORE, MD., U. S. A.

MONTGOMERY & CO.,

IMPORTERS

Stubs' Files, Tools and Steel, Grobet Swiss Files,

CHESTERMAN'S MEASURES,

Hubert's French Emery Paper, Horseshoe Magnets, &c.

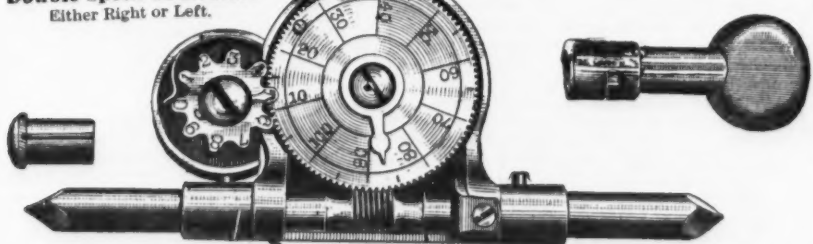
WM. SMITH & SON'S CELEBRATED MUSIC WIRE, Nos. 2 to 30

French Sheet Steel, 3 1/4 in. wide, from 4 to 65 thousandths.

Machinists', Silversmiths', Jewelers', Die Sinkers' and Sewing Machine Manufacturers' Supplies.

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Double Speed Indicator.

Either Right or Left.



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GEO. W. CHURCH.

105 Fulton St., NEW YORK.

Eureka Patent Shear

For Cutting Round and Flat Bar Iron and Sheet Metal.
MADE ENTIRELY OF CAST STEEL.

Cheapest and best tool for the purpose ever put on the market.

MADE IN TWO SIZES:

No. 1 will cut up to 1/2-in. Flat and 3/4-in. Round.

No. 2 will cut up to 3/4-in. Flat and 1-in. Round.

Send for Descriptive Circular.

EUREKA SHEAR CO.,

811 Market St., Philadelphia, Pa.



Henderson's Patent Gas Furnace,

Realizes Perfect Utilization of Coal as Fuel,

PRODUCES INGOT IRON FREE OF CARBON and

INGOT STEEL OF ALL GRADES OF CARBON,

From every kind of Pig Iron or Pig and Wrought Scrap Iron.

Apply to JAMES HENDERSON,

BELLEVILLE, CENTRE CO., PA.

NEW HAVEN HORSE NAILS

ARE THE BEST IN THE WORLD.

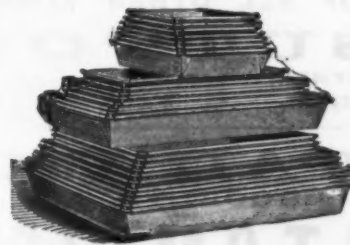
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AGENTS FOR THE WEST.

DRIPPING PANS.



BEST SMOOTH-FINISHED IRON.

13 SIZES, AS FOLLOWS:

7 x 8 inches, 7 x 14 inches, 7 1/2 x 9 inches, 8 x 10 inches, 8 x 17 inches, 9 x 14
inches, 10 x 15 inches, 10 x 19 inches, 11 x 16 inches, 12 x 17
inches, 14 x 15 inches, 16 x 17 inches, 18 x 19 inches.

MANUFACTURED BY

SIDNEY SHEPARD & CO.,

Proprietors of THE BUFFALO STAMPING WORKS,

BUFFALO, N. Y., and CHICAGO, ILL.

200,000 SOLD IN TWO YEARS.

UNBREAKABLE

(CAST METAL)

Lamps & Oilers.

CAST IN ONE PIECE.

No Seams,

No Leak,

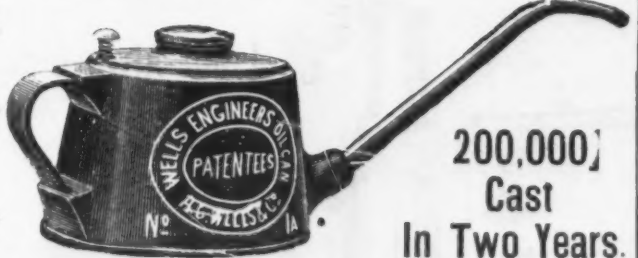
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The Common Sense Sash Holder and Lock Combined.

Patented March 6th, 1883.



Is the best, cheapest
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Sash Holder and
Lock in the market,
and we think it
the largest sale. It
holds the window at
any point, and it
locks the same when
down, and entirely
prevents windows
from rattling.

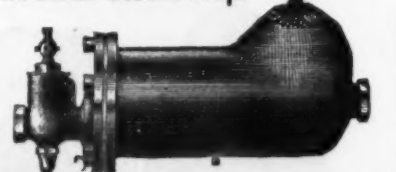
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er of this patent, and
sole manufacturer
of these fasteners,
and all persons are
hereby notified of
this fact. Any per-
son infringing will
be dealt with ac-
cording to law. Par-
ties who have been
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the "Practical Fast-
ener," so-called, will
do well to heed the
warning. Orders
from the trade re-
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Circular with price
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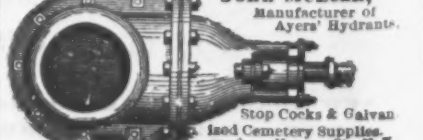


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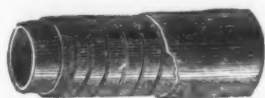
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Chain Pump Tube, Curbs, &c.

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ESTABLISHED 1839.

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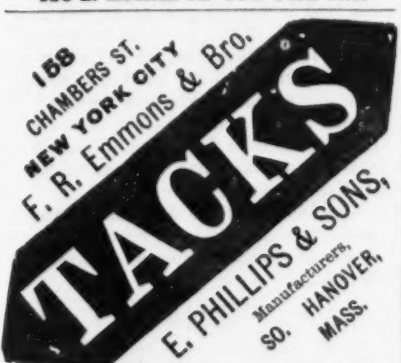


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'Calkers', Carpenters', Stone Cutters', Tin, Copper and Boiler Makers' MALLETs,

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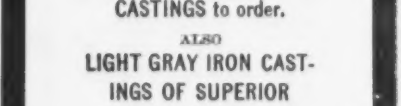
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FINE BRONZE and BRASS CASTINGS to order.

ALSO LIGHT GRAY IRON CASTINGS OF SUPERIOR QUALITY.



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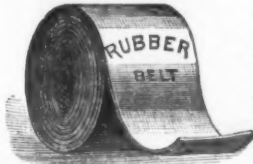
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Machine Belting,
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This company manufactured the immense DRIVING and ELEVATOR BELTS for the Buckingham Elevators at Chicago, which have been running perfectly for more than Twelve Years, also those for Armour, Dole & Co., of Chicago, Vanderbilt's Elevators for the N. Y. Central & Hudson River R. R., the great Elevators of the Penna. and Erie Railroads, of Jersey City and Hoboken, Dow's Stores, of Brooklyn, and many others; in fact, the largest Belts for the largest Elevators in the world.

A single carrier belt in the Penna. R. R. Elevator is over 200 feet long, weighing 18,000 pounds, and has run perfectly from the start.

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Circular Woven-Seamless Antiseptic RUBBER LINED "CABLE" HOSE and "TEST" HOSE, Vulcanized Para Rubber and Carbolized Duck, for the use of Steam and Hand Fire Engines, Force Pumps, Mills, Factories, Steamers, Ships, Hospitals, &c

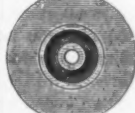


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"CABLE" ANTISEPTIC.

Emery Wheels and Packing.

ORIGINAL.



Solid Vulcanite EMERY WHEELS

Emery Wheel.

LARGE WHEELS MADE ON CAST-IRON CENTER IF DESIRED.

Section of Emery Wheel showing Iron Center.

The properties of these Wheels are such that they can be used with great advantage and economy for cutting, grinding and finishing Wrought and Cast Iron, Chilled Iron, Hardened Steel, Slate, Marble, Glass, etc. These wheels are extensively used by manufacturers of Hardware, Cutlery, Edge Tools, Flows, Saws, Stoves, Fire Arms, Wagon Springs, Axes, Skates, Agricultural Implements, and small Machinery of almost every description.

Pat. Jan. 16, 1880.

PATENT ELASTIC

Pat. Jan. 24, 1880.

Rubber Back Square Packing.

BEST IN THE WORLD.

For Packing the Piston Rods & Valve Stems of Steam Engines & Pumps. B represents that part of the packing which, when in use, is in contact with the piston rod. A the elastic back, which keeps the part B against the rod with sufficient pressure to be steam tight. This Packing is made in lengths of about 20 feet, and of all sizes from 1/4 to 2 inches square.

Corrugated Rubber Mats and Matting.

For Halls, Flooring, Stone and Iron Stairways, &c.

This practical and indispensable article—especially for wear where exposed to ice, snow or slush—was first introduced by this company several years ago, and its real value is in being almost indestructible, when proper materials are used in its manufacture, whilst the cheap, inferior quality forced on the public by reckless imitators of our patent goods soon becomes brittle and crumbles to pieces. Address:

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The most complete assortment in the U. S. of
Shank, Socket Firmer and Socket Framing Chisels.

PLANE IRONS.

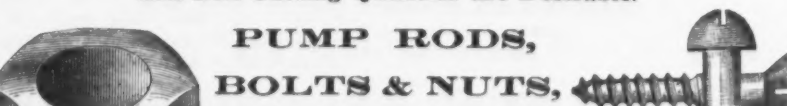
CAUTION.—Buyers should be on their guard and not have inferior goods palmed on them by unprincipled persons, who represent them as our make. Our tools are stamped "BUCK BROTHERS," and our labels have on our trade-mark also "Riverlin Works."

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BEARINGS, SLIDE VALVES, CYLINDER RINGS, CROSS-HEAD GIBBS, STEPS, BUSHINGS,

And all purposes where Maximum Durability, Anti-Frictional and Non-Cutting Qualities are Desirable.



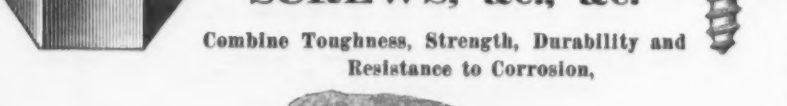
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BOLTS & NUTS,

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SCREWS, &c., &c.

Combine Toughness, Strength, Durability and Resistance to Corrosion.



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CASTINGS OF ALL KINDS TO ORDER.
SEND FOR PAMPHLET AND PRICES.

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Owners of the U. S. Phosphor-Bronze Patents. Sole Manufacturers of Phosphor-Bronze in the United States.

Sable Iron Works, J. & J. Rogers Iron Company, Ausable Forks. Number of nail machines, 10. Nail department idle. Will probably never make nails again for the market.

New Jersey.

Boonton Iron Works, Boonton. Number of nail machines, 150. Idle since 1876.

Cumberland Nail and Iron Company, Bridgeton. Number of nail machines, 84.

Annual capacity, 140,000 kegs of cut nails.

Oxford Iron and Nail Company, Oxford. Number of nail machines, 103. Annual capacity, 250,000 kegs of cut nails.

Pennsylvania.

American Iron Works, Jones & Laughlins, Pittsburgh. Number of nail machines, 63. Annual capacity, 150,000 kegs of cut nails and spikes.

Anchor Nail and Tack Works, Chess, Cook & Co., Pittsburgh. Number of nail machines, 96. Annual capacity, 250,000 kegs of cut nails and spikes.

Atlantic Iron and Nail Works, P. L. Kimberly & Co., Sharon. Number of nail machines, 40. Annual capacity, 75,000 kegs of cut nails.

Bellefonte Rolling Mills and Nail Factory, Bellefonte Iron Company, Limited, Bellefonte. Number of nail machines, 30. Annual capacity, 65,000 kegs of cut nails.

Birdsboro Nail Works, E. & G. Brooke Iron Company, Birdsboro. Number of nail machines, 100. Annual capacity, 240,000 kegs of cut nails.

Cambria Iron Company, Johnstown. Preparing to engage in the manufacture of steel nails.

Chesapeake Nail Works, Chas. L. Bailey & Co., Harrisburg. Number of nail machines, 103. Annual capacity, 275,000 kegs of cut nails.

Clinton Rolling Mill, Graff, Bennett & Co., Pittsburgh. Number of nail machines, 41. Not running nail machines.

Danville Nail Works, Danville Nail and Manufacturing Company, Danville, Montour County. Built in 1882-83, and first put in operation August 31, 1883. Number of nail machines, 15. Annual capacity, 60,000 kegs of cut nails and spikes.

Duncannon Iron Company, Duncannon. Office, 122 Race street, Philadelphia. Number of nail machines, 64. Annual capacity, 140,000 kegs of cut nails.

Etna Iron Works, Limited, Newcastle, Lawrence County. Number of nail machines, 55. Annual capacity, 120,000 kegs of cut nails.

Harrisburg Nail Works, McCormick Estate, Harrisburg. Works at Fairview, Cumberland County. Number of nail machines, 78. Annual capacity, 175,000 kegs of cut nails.

Holidaysburg Iron Works, Holidaysburg Iron and Nail Company, Holidaysburg. Number of nail machines, 22. Annual capacity, 60,000 kegs of cut nails and spikes.

Juniata Iron and Steel Works, Shoenberger & Co., Pittsburgh. Number of nail machines, 92. Annual capacity, 225,000 kegs of cut nails.

Juniata Rolling Mill, McLanahan, Smith & Co., Limited, Holidaysburg. Number of nail machines, 30. Annual capacity, 60,000 kegs of cut nails.

Kensington Iron and Steel Works, James Rowland & Co., 920 North Delaware avenue, Philadelphia. Number of nail machines, 38. Annual capacity, 60,000 kegs of cut nails.

Milton Nail Works, C. A. Godcharles & Co., Milton. Number of nail machines, 75. Annual capacity, 130,000 kegs of cut nails.

Northumberland Iron and Nail Works, Van Alen & Co., Northumberland. Number of nail machines, 30. Annual capacity, 70,000 kegs of cut nails.

Portage Iron Company, Limited, Duncansville. Number of nail machines, 37. Annual capacity, 60,000 kegs of cut nails.

Pottstown Iron Company, Pottstown. Number of nail machines, 79. Annual capacity, 300,000 kegs of cut nails. Adding 20 more nail machines.

Reuben Johnson & Co., Northumberland. Building a nail works to contain about 36 nail machines, to have annual capacity of 75,000 kegs of cut nails. Will go into operation about December 1.

Sable Iron and Nail Works, Zug & Co., Pittsburgh. Number of nail machines, 60. Annual capacity, 120,000 kegs of iron and iron-steel nails.

Sharon Iron Company, Sharon. Number of nail machines, 46. Annual capacity, 90,000 kegs of cut nails. Intend to add 18 more nail machines.

Shenango Iron Works, Newcastle. Number of nail machines, 55. Annual capacity, 150,000 kegs of cut nails.

Standard Nail and Iron Company, Williamsport. Works at Crescent. Number of nail machines, 17. Annual capacity, 30,000 kegs of cut nails.

Sunbury Nail Works, Sunbury Nail, Bar and Guide Iron Manufacturing Company, Sunbury. Built in 1883, and first put in operation August 29, 1883. Number of nail machines, 25. Annual capacity, 60,000 kegs of cut nails.

Towanda Nail Works, R. A. Bostley & Co., Towanda. Number of nail machines, 26. Annual capacity, 60,000 kegs of cut nails.

Vesuvius Iron and Nail Works, Moorhead Brothers & Co., Pittsburgh. Number of nail machines, 49. Annual capacity, 94,000 kegs of cut nails.

Williamsport Rolling Mill and Iron Works, Milton Iron Company, Williamsport. Nail plant added in 1882-83. Number of nail machines, 50. Annual capacity, 95,000 kegs of cut nails.

Virginia.

Graham & Robinson, Graham's Forge. Number of nail machines, 5. Have been idle for many years, and will probably never make nails again.

James River Iron Works, four miles above Lynchburg. Works purchased by A. H. Leftwich, who will convert them into a nail works.

Old Dominion Iron and Nail Works, Richmond. Works on Belle Isle. Number of nail machines, 100. Annual capacity, 300,000 kegs of cut nails.

West Virginia.

Belmont Nail Company, Wheeling. Number of nail machines, 131. Annual capacity, 350,000 kegs of cut nails. Will make steel nails next spring.

Benwood Iron Works, Benwood, Marshall County. Office at Wheeling. Number of nail machines, 124. Annual capacity, 308,000 kegs of cut nails. Erecting Bessemer steel works, to consist of two 4-ton converters, to produce steel for the manufacture of steel nails. Expect to add 16 more nail machines before the close of this year.

La Belle Iron Works, Wheeling. Number of nail machines, 122. Annual capacity, 275,000 kegs of cut nails and spikes.

Riverside Iron Works, Wheeling. Number of nail machines, 126. Annual capacity, 325,000 kegs of cut nails. Will add 18 more nail machines this year. Erecting Bessemer steel works, to consist of two 4-ton converters, to produce steel for nails.

Standard Nail Works, Standard Nail and Iron Company, Clifton. Number of nail machines, 76. Annual capacity, 150,000 kegs of cut nails and spikes. Will add 49 more nail machines this year.

Top Mill, Wheeling Iron and Nail Company, Wheeling. Number of nail machines, Annual capacity, 260,000 kegs of cut nails.

Alabama.

Brierfield Coal and Iron Company, Brierfield. First nails made in September, 1883. Number of nail machines, 60. Annual capacity, 160,000 kegs of cut nails. Intend to add 40 more nail machines.

Kentucky.

Norton Iron Works, Ashland. Number of nail machines, 94. Annual capacity, 275,000 kegs of cut nails.

Tennessee.

Knoxville Iron Company, Knoxville. Number of nail machines, 41. Annual capacity, 75,000 kegs of cut nails.

South Tredegar Iron Company, Chattanooga. Number of nail machines, 71. Annual capacity, 190,000 kegs of cut nails.

Ohio.

Belfont Iron Works, Belfont Iron Works Company, Ironton. Number of nail machines, 126. Annual capacity, 300,000 kegs of cut nails.

Bellaire Nail Works, Bellaire. Number of nail machines, 124. Annual capacity, 338,000 kegs of cut nails and spikes. Erecting Bessemer steel works, to contain two 4-ton converters, to produce steel for the manufacture of steel nails.

Falcon Iron and Nail Works, Falcon Iron and Nail Company, Niles. Number of nail machines, 44. Annual capacity, 100,000 kegs of cut nails.

Jefferson Iron Works, Steubenville. Number of nail machines, 115. Annual capacity, 340,000 kegs of cut nails. Intend adding 20 more nail machines.

Junction Iron Company, Mingo Junction. Office, Wheeling, W. Va. Nail mill built in 1882, and put in operation November 30, 1882. Number of nail machines, 126. Annual capacity, 300,000 kegs of cut nails and spikes.

Kelly Nail and Iron Company, Ironton. Built in 1883, and first put in operation in November, 1883. Number of nail machines, 100. Annual capacity, 200,000 kegs of cut nails and spikes.

Laughlin Nail Company, Martin's Ferry. Office, Wheeling, W. Va. Number of nail machines, 114. Annual capacity, 312,000 kegs of cut nails and spikes.

Mahoning Iron Works, Brown, Bonnell & Co., Youngstown. Number of nail machines, 50. Annual capacity, 130,000 kegs of cut nails.

Spaulding Iron Company, Brilliant. Built in 1882-83, and will be put in operation during the present month. Number of nail machines, 60. Annual capacity, 180,000 kegs. Prepared to make both iron and steel nails.

Indiana.

Aurora Iron Mills, Cobb's Iron and Nail Company, Aurora. Number of nail machines, 37. Annual capacity, 104,000 kegs of steel and combined iron and steel nails. Intend to add more nail machines soon.

Greencastle Iron and Nail Company, Greencastle. Number of nail machines, 45. Annual capacity, 100,000 kegs of cut nails and spikes.

Terre Haute Iron and Nail Works, Terre Haute. Number of nail machines, 126. Annual capacity, 325,000 kegs of cut nails.

Illinois.

Belleville Nail Company, Belleville. Number of nail machines, 72. Annual capacity, 150,000 kegs of cut nails.

Calumet Iron and Steel Company, Cummings. Office, 57 Dearborn street, Chicago. Number of nail machines, 115. Annual capacity, 300,000 kegs of iron and steel nails.

Centralia Iron and Nail Works, Centralia. Number of nail machines, 36. Annual capacity, 90,000 kegs of cut nails.

Western Nail Company, Belleville. Nail mill built in 1882, and first put in operation September 4, 1882. Destroyed by fire April 25, 1883, and rebuilt and put in operation June 25, 1883. Number of nail machines, 72. Annual capacity, 180,000 kegs of cut nails. Will add 54 more nail machines before the close of this year.

Wisconsin.

North Chicago Rolling Mill Company, Bay View. Office, Milwaukee. Have commenced the erection of a nail mill to contain 100 nail machines, to be completed by January 1, 1884. They will have an annual capacity of 350,000 kegs of iron and steel nails.

Nebraska.

Omaha Nail Works, John D. Creighton, Omaha. Number of nail machines, 26. Annual capacity, 60,000 kegs of cut nails.

Colorado.

Colorado Coal and Iron Company, South Pueblo. Number of nail machines, 27. Annual capacity, 120,000 kegs of cut nails.

California.

Pacific Iron and Nail Company, Oakland. Built in 1882-83. Number of nail machines, 70. Annual capacity, 150,000 kegs of cut nails.

Compared with last year, the imports of iron and lead show a heavy decline, while steel is coming over in much larger quantities. Tin imports are about the same in quantity, except as to slabs, which are increased about 20 per cent. Imports of cutlery and hardware are almost nominal.

The Iron Age

AND
Metallurgical Review.

New York, Thursday, November 15, 1883.

DAVID WILLIAMS, Publisher and Proprietor.
JAMES C. BAYLES, Editor.
JOHN S. KING, Business Manager.

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Published at 44a Cannon St., London.

The oldest and leading representative of the British Iron and Hardware Trades.

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Proposed Mexican Reciprocity Treaty.

By an amendment to the Mexican constitution, to take effect December 1, 1882, State customs duties are abolished, thus removing a serious impediment to foreign trade. This obstacle, together with the lack of means of transportation, has been almost prohibitory in its effects upon trade with the great mass of population distant from the seaboard, who were well-nigh inaccessible. The several Mexican States are at present so far dependent for revenues upon the right to levy taxes on imports, in addition to customs duties collected by the General Government, that at the last advice an assembly of delegates from all parts of the Republic were deliberating upon a scheme of local taxation, designed as a substitute for sources of revenue which cease under the new Constitutional amendment. In anticipation of these changes, and in order that merchants in the United States may be prepared to take advantage of improved trade facilities, Consul-General Sutton, at Matamoros, has carefully examined the proposed commercial treaty between the United States and Mexico, and transmitted the results to the State Department at Washington. His report is based upon the imports for the year ending June 30, 1882, and he answers in the affirmative the two important questions, viz.: 1. "Does the United States receive concessions equal to or greater than those which are conceded?" 2. "Will the treaty benefit our export trade to Mexico?" These points he sustains by referring to the promised abolition of the heavy inter-State duties, sometimes ranging as high as 12 per cent.; also to the more amicable relations which will arise from the simple fact that a treaty exists. Moreover, the strenuous opposition experienced from European traders of all classes is of itself satisfactory evidence that the treaty would work beneficially for us. Mr. Sutton says the utmost care has been taken with the tables to make them reliable, and he has especially endeavored not to overestimate the promised advantages.

Briefly epitomized, the more general statements in Consul-General Sutton's communication may be given as follows: The total value of goods imported from Mexico was \$6,376,105, of which \$3,895,147 are now free

of duty. Of the rest, \$2,470,973 was represented in five articles—sugar, hemp, istle, tobacco in leaf, and fruits, and the amount of duty to be remitted by the United States is but \$179,075. The duties on sugar were \$75,000. The fear that Mexican sugar would flood our markets in case the treaty is adopted is shown to have no foundation. Only 1/10 of 1 per cent. of our imported sugar comes from Mexico, and if we should take the entire amount exported from that country, it would make but 1/4 of 1 per cent. Favorable circumstances might increase the product of sugar in Mexico. Export duties and the increasing home consumption, however, in Mr. Sutton's opinion, will prevent any great increase of the export to this country. Against the \$179,075 remitted by this Government, Mexico would have to concede duties amounting to \$742,980, or \$668,116 when reduced to our money. Of this, \$425,000 is levied on petroleum, for which, with the duty raised, there would be a heavy demand. The next largest item is for carriages, \$157,500, and with that impost abolished we should have a monopoly of the carriage trade in Mexico, while in machines, tools, clocks, steam engines and stoves we should gain the trade now carried on by England. The direct cash difference in our favor would be \$439,041, while, as Mr. Sutton says, "In the great struggle for Mexican trade we have the advantage of location and railway connections, but with the low rates of interest, the low prices at which they can sell their goods, their quick and cheap ocean freights, and the skill and perseverance with which Europeans prosecute the work, we shall need all our advantages to keep the ascendancy. It is only recently that we have put forth active and intelligent efforts to get our share. This treaty is one of the most vital factors."

According to present indications, the proposed reciprocity treaty will come before Congress early in the coming session, as it is important to the interests of all concerned that decisive action be taken, if for no other reason than that by December 1, 1884, two great trunk lines of railway—the National and the Central—will probably be finished to the Mexican capital. At the same date the International Exhibition of Mexican products will be opened at New Orleans.

The Nail Trade.

The Secretary of the American Iron and Steel Association has just published authentic information concerning the nail factories of the United States, as they exist at the present time, which we reproduce in another part of this issue. The publication of this information is timely, as everybody connected with the trade knows that since the appearance of the last official statement of this kind many new nail machines have been put in operation, especially in the West, but very few persons were aware of the exact extent of the additions thus made. In August, 1882, there were 68 nail factories, which contained 4167 machines, having an estimated capacity of 9,500,000 kegs of nails per annum. There are now 74 factories, containing 5008 machines, with an annual capacity of 11,376,000 kegs. Five more works are in progress of erection, to contain at least 200 machines, and 391 machines are being added to existing factories, all of which will probably be completed by the 1st of January, when there will be a total of 5599 machines in 79 works. Basing an estimate on existing factories, the capacity of the country on the 1st of January will be about 12,500,000 kegs of nails per annum.

These figures of capacity, we understand, are based on the very best work of which an establishment is capable, running every working day of every month in the year. This, however, is so rarely accomplished in actual practice, no matter how high the price of nails may be, that 20 per cent. can safely be deducted from these totals in order to approximate actual capacity. This would leave 7,500,000 kegs as the annual capacity in August, 1882, against 10,000,000 kegs at the close of this year, which is an increase of 33 1/3 per cent. in less than a year and a half. The following table shows where the nail factories of the country are located, the number in each State, the number of machines in completed works, the annual capacity of the works, and the number of machines to be added:

States.	Number of completed works.	Number of machines in Nov. 1.	Annual capacity in kegs.	Nail machines to be added.
Maine.....	1	33	80,000	—
Massachusetts.....	10	616	850,000	29
New York.....	2	55	55,000	—
New Jersey.....	3	337	600,000	—
Pennsylvania.....	27	1,455	3,214,000	74
Virginia.....	2	175	315,000	—
W. Virginia.....	6	69	1,925,000	83
Alabama.....	1	60	120,000	40
Kentucky.....	1	94	275,000	—
Tennessee.....	2	112	267,000	—
Ohio.....	3	839	2,350,000	20
Indiana.....	3	303	629,000	—
Illinois.....	4	205	720,000	54
Wisconsin.....	—	—	—	103
Nebraska.....	1	26	60,000	—
Colorado.....	1	27	120,000	—
California.....	1	70	150,000	—
Machines to be added (est. d.).....	—	—	—	200
Total.....	74	5,008	11,376,000	501

As there is a well-defined distinction between the Eastern and Western nail trade, the Allegheny Mountains being considered the dividing line, and Virginia the only Southern State included with the East, we have ascertained the number of works in each of these sections, together with the

number of nail machines and their capacity, which we present in the following table:

	No. completed works.	No. nail machines Nov. 1.	Annual capacity in kegs.	Nail machines to be added.
East.....	35	2,030	3,996,000	126
West.....	38	2,978	7,377,000	465
Total.....	74	5,008	11,376,000	591

From this table it will be observed that almost two-thirds of the present nail-producing capacity of the country is located west of the Allegheny Mountains, and by the 1st of January that section will have over two-thirds. This accounts for the importance attached to movements in the Western nail trade. If Western factories were to run steadily up to their full capacity, they could almost, if not quite, supply all the nails which this entire country requires. The production of the United States has never exceeded 6,147,097 kegs, which was the product of 1882.

In the published list of nail factories some curious points appear. Four works make patent combined iron and steel nails—the Pembroke Iron Works, Maine; Tremont Nail Works, Massachusetts; Sable Iron and Nail Works, Pennsylvania, and Aurora Iron Mills, Indiana. Three make steel nails—the Albany and Rensselaer Iron and Steel Company, New York; Aurora Iron Mills, Indiana, and Calumet Iron and Steel Company, Illinois. Three works are erecting Bessemer steel plants, each consisting of two 4-ton converters, to make steel expressly for nails—the Benwood Iron Works, West Virginia; Riverside Iron Works, West Virginia, and Bellaire Nail Works, Ohio. Four works are making preparations to manufacture steel nails—the Belmont Nail Company, West Virginia; Cambria Iron Company, Pennsylvania; Spaulding Iron Company, Ohio, and North Chicago Rolling Mill Company, Wisconsin. The Belmont Nail Company, of West Virginia, have the largest number of nail machines of any active establishment in the country, 131; the Boonton Iron Works, of New Jersey, which are credited with 150 machines, not having been in operation for seven years. The Riverside Iron Works, West Virginia; Belfont Iron Works, Ohio, and Junction Iron Company, Ohio, come next, with 126 machines each. In a short time, however, the Riverside Iron Works will go to the front, as 18 machines are to be added to its plant, which will then embrace 144 machines.

Although these facts, which show very remarkable development in this branch of the iron trade, are therefore gratifying to all who are sentimentally interested in national growth, they are full of ominous meaning to those actually engaged in the nail trade. The experience of the past year, with its numerous attempts to restrict Western production inside of manageable bounds, is not favorable to the absorption by the country of greatly increased quantities of nails, such as the factories are now, or shortly will be, able to turn out. Prices may be held at a satisfactory figure by a continuation of the restrictive policy until the demand more closely approximates the supply, but the issue is a doubtful one in view of the new elements being infused into the trade.

The Reese Basic Patents Litigation.

The Pittsburgh Dispatch for the 7th inst. states that negotiations have for some time been in progress between the Bessemer Steel Company, Limited, of Philadelphia, and Mr. Jacob Reese, of Pittsburgh, involving the settling of the suits now pending over the ownership of Mr. Reese's patents for the manufacture of steel by the basic Bessemer process, but Mr. Reese has refused to accept the proposition of the company. At the same time information reaches us from St. Louis to the effect that the Bessemer Steel Company have compromised their suit with the Harrison Steel Company, of St. Louis.

It will be remembered that about two years ago the announcement was made that the Harrison Steel Company had bought certain patents pertaining to the manufacture of basic Bessemer steel of Mr. Jacob Reese, of Pittsburgh. Prior to that time Mr. Reese had sold certain other patents pertaining to the same process to the Bessemer Steel Company, Limited, and litigation followed. The latter company entered suit in the United States Court in St. Louis last spring against their making use of the Reese patent. About a month ago, it is reported, the suit was dismissed without prejudice on a demurrer filed by the defendant, claiming that Mr. Reese should have been made a co-defendant. After the dismissal of the suit, negotiations were opened between the Harrison Steel Company and the Bessemer Steel Company, which have just resulted in a license to the former company for the use of the Reese patent on a royalty basis. This leaves the Harrison Steel Company free to go on with the erection of their plant at Harrison, Ill., a few miles from St. Louis. The company had been organized, with a capital of \$3,000,000, and had commenced work when stopped by the suit. Works will now be erected at Harrison, to manufacture basic Bessemer steel on a large scale for plates, sheets, rods, bars, &c., but, it is understood, not for rails. The plant will embrace blast furnaces, as well as steel-converting works, so as to control the entire process from the ores to the finished product. It is understood that Mr. Jay Cooke, of Philadelphia, the well-known financier, is interested in this enterprise.

It is possible that legal complications with Mr. Reese may annoy the Harrison Steel

Company to some extent, although we are assured by a gentleman who is conversant with the facts in the case that the company will erect their works, nevertheless. The question of the proper parties to receive the royalty will be settled by the courts, but there is apparently now no ground for interference with the actual erection of the works.

The basic process has for several months been in use by the Pennsylvania Steel Company at Harrisburg, Pa., and a few days ago Mr. Reese notified the company that unless they stop infringement upon his patent he will enter suit. It is said that a bitter fight over the coveted patents is imminent, and we do not doubt the statement, as we know of several establishments which have for a long time been anxious to manufacture steel by the basic process, but are unable to secure licenses to that effect from the Bessemer Steel Company. If the ownership of the patent is decided to be vested in Mr. Reese, he will, of course, issue licenses to all applicants, but the policy of the Bessemer Steel Company has been conspicuously restrictive.

The Condition of Trade.

There have been no exciting or sensational occurrences in the iron and steel trades during the past week, but, on the contrary, a dead level of dullness has prevailed. In pig iron the movement was generally sluggish, and while some establishments enjoyed a fair trade, others did but a small amount of business. Theoretically, the pig-iron trade is in good condition, as production is not excessive, stocks are light, foreign iron is out of the market, and consumption continues to be of quite fair proportions, but practically there appears to be a limited demand, sellers are more numerous than buyers, and prices, while not weak, have no suggestive strength. The desired upward tendency has not shown itself, and until it appears buyers will not be eager to fill their yards. They are still very willing to let the furnace companies carry the stocks which they themselves ought to have. Manufactured iron did not move freely during the time under review. The stores did not do even an average business, and the large buyers showed no disposition to take hold at present prices. Bar iron is still sadly demoralized, and prices are nominal, depending entirely upon the size of the order, the character of the specifications and the necessities of the seller. Sheet and plate iron were both very dull, and there is no sign of improvement. Nails exhibited decided indications of lower prices, and if Western factories are not stopped for a few weeks, much lower rates will be feared.

Although rumors have been quite extensively circulated to the effect that large quantities of steel rails were sold last week, the orders placed were comparatively small, the decline in price of the previous week not having induced the business that was anticipated. There are heavy orders in sight, but protracted negotiations may have to be conducted before they are placed. Yet it is not expected that rails will be sold below \$35. There is a great deal of close figuring on items of cost now being done by the steel-rail mills, and it is likely that very few of them can show a profit at present figures. Wages will very probably be reduced at most of them this winter. It is reported that both the Edgar Thomson and the Cambria works are considering the wages problem, and the managers of the Troy works say they are willing to run at cost, or a shade below it, to keep their men employed and to retain their organization. Workingmen should be willing to make a fair concession to the urgency of the situation, and should agree to work at such wages as will permit their employers to continue operations. "Half a loaf is better than no bread."

October Imports of Iron and Steel.

The imports of iron and steel at the port of New York were lower in the month of October than in September. The difference between the imports of the two months amounted to nearly 5000 tons, excluding tin plates, but, including them, the falling off was barely 3000 tons. The changes in the movement of the two months are fully set forth in detail in the following table:

	Gross tons—September.	October.
Pig iron.....	10,441	7,452
Spiegel Eisen.....	7,580	8,275
Swedish iron.....	1,573	3,040
Steel wire rods.....	3,041	2,117
Steel rails.....	3,019	1,411
Scrap iron.....	3,622	1,338
Russia sheet iron.....	135	855
Scrap steel.....	690	771
Old rails.....	None.	701
Steel bars, &c.....	547	474
Steel tires and forgings.....	465	484
Sheet iron.....	430	410
Iron wire rods.....	572	200
Iron tubes.....	None.	140
Iron bars, &c.....	38	141
Steel blooms.....	None.	75
Iron beams.....	18	69
Hoop iron.....	60	None.
Total.....	848	None.

Total, except tin plates..... 33,518
Tin plates..... 9,222
Total..... 42,740

The imports of iron ore and other metals than iron and steel are shown in the following table:

	Gross tons—September.	October.
Iron ore.....	2,355	2,704
Slab and ingot tin.....	1,064	871
Pig lead.....	108	101
Spelter.....	59	73
Scrap zinc.....	10	None.
Old copper.....	2,650	7,690
Old brass.....	1,321	7,352
Old lead.....	None.	6,063
Sheet antimony.....	33,528	33,528
Regulus antimony.....	92,000	110,400
Nickel alloy.....	14,002	31,198

The exports of metals from New York in the two months referred to were as follows:

	Gross tons—September.	October.
Pig iron.....	228	325
Steel rails.....	300	325
Iron rails.....	235	120
Iron bars, &c.....	130	19
Tin plates.....	15	19
Ingot copper.....	872	921
Old brass.....	35	None.
Slab and ingot tin.....	11,000	9,845
Spelter.....	None.	1,720
Sheet zinc.....	None.	2,400

The stocks of iron and steel held in the warehouses of the United States at New York, Boston, Philadelphia, Baltimore and New Orleans, on the 1st of November, were as follows:

	New York.	Gross tons—Other ports.	Total.
Pig iron.....	1,513	2,401	3,914
Spiegel Eisen.....	539	1,140	1,679
Old rails.....	1,135	1,165	2,300
Scrap iron.....	894	1,457	2,351
Scrap steel.....	806	None.	806
New iron rails.....	None.	100	100
Steel rails.....	121	525	646
Total.....	5,068	6,787	11,855

As compared with the total stocks held on the 1st of January, these figures show a shrinkage of 17,418 tons.

Developments in the European and American Copper Markets.

The recent downward tendency in the European copper markets invites attention to the English statistics, as furnished us by our Liverpool correspondent. The comparative importations of copper produce into Liverpool and Swansea for the years ending September 30, 1882, and September 30, 1883, were as follows:

From	1882.	1883.	Inc.	Dec.
The United States.....	Tons. 727	Tons. 6,289	Tons. 5,562	Tons. 5,562
Canada.....	254	867	118	118
Mexico.....	211	530	419	419
Peru.....	416	419	3	3
River Plate.....	318	401	83	83
New Queensland.....	3,852	3,872	20	20
Cape.....	5,325	7,006	1,681	1,681
Spain.....	429	1,369	940	940
Spanish Possessions.....	8,857	10,403	1,546	1,546
Italy.....	764	512	—	—
Newfoundland.....	1,701	1,838	137	137
Norway.....	406	365	—	—
Australia.....	351	194	—	—
Portugal.....	31	133	102	102
Sundries.....	1,649	1,489	—	—
Total.....	23,574	34,789	10,215	10,215
Chili.....	47,682	30,123	—	—
Australian, &c., to London.....	10,328	8,629	—	—
Grand total.....	63,579	73,551	10,224	10,224

Net increase, 9,972 tons fine.

The import of copper produce for the year ending September 30 last, says our correspondent, as compared with the previous 12 months, has been very carefully made up. You will notice the large increase in the import from the United States, Spain and the Cape. Values with us have given very considerably during the first fortnight in October, to the extent of about 30/ per ton. This appears to be chiefly due to the fact that some of the large holders have lost faith in the future of the market, and have commenced to sell a portion of their stocks. This is hardly surprising, as the import into England during the past 12 months has exceeded that of the previous 12 months by about 10,000 tons fine, as the above table shows. On the other hand, however, the consumption has also largely increased. The future of our market mainly depends upon the supplies from the United States. If they continue on the same scale as of late, we shall doubtless see lower prices.

The following table shows stocks and consumption in England and France of English copper and English exports for three years, in tons:

	1881.	1882.	1883.
Stocks, all kinds, in England, Jan. 1st.....	41,805	41,805	41,805
Imports, all kinds, in England, Jan. 1st.....	31,650	31,650	31,650
Exports, all kinds, in England, Jan. 1st.....	3,318	3,318	3,318
Stocks, all kinds, in France, Jan. 1st.....	3,437	3,437	3,437
Imports, all kinds, in France, Jan. 1st.....	3,437	3,437	3,437
Exports, all kinds, in France, Jan. 1st.....	3,437	3,437	3,437
Stocks, all kinds, in England, Jan. 1st.....	41,805	41,805	41,805
Imports, all kinds, in England, Jan. 1st.....	31,650	31,650	31,650
Exports, all kinds, in England, Jan. 1st.....	3,318	3,318	3,318
Stocks, all kinds, in France, Jan. 1st.....	3,437	3,437	3,437
Imports, all kinds, in France, Jan. 1st.....	3,437	3,437	3,437
Exports, all kinds, in France, Jan. 1st.....	3,437	3,437	3,437

From the table the increase of consumption during the first nine months appears as under:

	1881.	1882.	1883.
Consumption in England.....	24,041	33,731	31,339
Consumption in France.....	19,340	17,079	20,837
Total.....	43,381	50,810	52,176

Consumption in England and France has therefore been about 20 per cent. greater during the first nine months of 1882 and 1883 than it was two years ago.

Our correspondent remarks that the

would remark that, at present prices in Europe, it does not pay to ship Lake copper, and the Lake companies have made arrangements with manufacturers till the end of the year. Prices would have to improve a good deal in January and February to induce shipments this way by rail from the Lake region; hence Lake copper may be left out of the calculation till the spring months. As for ingot copper and furnace material from the Southwest, it is safe to assume that the consignments to England will continue unabated unless partially interrupted by the difficulties of transportation to the railroad depots during the winter. The freight rates by rail will not deter shipments even in winter if the smelting in England leaves a good margin for profit. We are now entering on a dull period in the copper and general metal trade, and therefore do not anticipate much change in prices either way. In England, where the speculative element so largely prevails in the copper market, we can foresee a good deal of fluctuation, the recent heavy failures having created a feeling of restlessness and uncertainty, not only in England, but throughout Europe.

Piracy of trade-marks has repeatedly attracted attention both here and abroad, but, notwithstanding the heavy penalties imposed in a few cases, the practice has not yet been entirely suppressed. Thus, United States Consul Van Riper, at Moscow, Russia, in a recent report remarks that, in trying to introduce American tools at different Russian establishments, he invariably encountered "American articles" of foreign manufacture, principally from Germany, bearing American trade-marks. Although the genuine American implements were of superior workmanship, it was found an extremely difficult matter to effect sales, the very much inferior imitations being offered at greatly lower prices. As a Russian will always buy that which is cheapest, regardless of quality, it is evident that American goods in that market labor under a serious disadvantage. We hope, however, that no effort will be made to extend our Russian trade by lowering the quality standard. Cut-throat trade of this kind soon becomes ruinously unprofitable, and the less our manufacturers have of it the better for them. It would be much better to take steps to secure the adequate protection of their trade-marks abroad, and to build up such trade as high-quality standards will command.

The fact that the water in the various streams of the New England States has been exceptionally low during this season again directs attention to the necessity of gradually substituting steam for water-power. A number of causes have conspired to diminish the supply, and it is now reported as rapidly falling in many places. On the whole, however, it is probable that with the present state of the market the drought will not be without beneficial effects, preventing an excessive accumulation of stock, and thus holding out brighter prospects for the future. At the same time the conditions may not always prove so favorable, and cases will unquestionably arise when the curtailment of production such as is now rendered necessary will be attended with serious inconvenience. It is evident that in these days of high-pressure business enterprises there are very few important lines of manufacturing which can afford to depend upon water-power, especially as its economy over steam, under the most favorable conditions, is so small as to warrant a doubt whether it is not largely imaginary.

Competition of Iron and Steel

To the Editor of The Iron Age.—DEAR SIR: The tendency to substitute steel for iron in the arts was never more marked than to-day. This substitution has been in progress for years; indeed, it has been inevitable from the moment of the discovery of the Bessemer process, but its progress was delayed during the early years of the manufacture of Bessemer steel while the process was being improved and its cost of manufacture cheapened. During the late panic, however, and the low prices of iron and steel, the latter metal was rapidly displacing the former. With the advance of prices and the great demand for all iron and steel products the rapidity of this substitution was somewhat checked, but with the low prices that are now ruling and the advantages that steel possesses as to quality and adaptability to many purposes, and the character of the labor employed, it is again fast encroaching on iron.

This substitution has been most marked, of course, in the case of rails. A few years ago all rails were made of iron; to-day the production of iron rails is less than it was during the worst years of the panic—1877 and 1878—and at the present relative price of iron and steel rails it is evident that steel must entirely supersede iron in railroad building. Steel is also being used, both open-hearth and Bessemer, in many forms of product for which, until within a very few years, iron alone was considered suitable. It is not ten years since British engineers showed conclusively to their own satisfaction that steel never could be used in boiler plates, into which it now largely enters. Grades of steel that were formerly produced by the crucible process are now made by Bessemer or open-hearth, and this has so cheapened these grades as to bring their price somewhat near the rate at which iron can be sold, and, in view of the superior quality of the steel, has led to its adoption in the place of iron. Steel has also largely supplanted iron in the manufacture of wire, hundreds of thousands of tons being annually consumed in its manufacture. Some of the last uses to which steel

has been put supplanting iron have been the manufacture of railroad car axles and of nails. As is well known, three Bessemer plants are already under construction for Wheeling nail mills, the product to be used in the manufacture of nails.

One reason that has led to the adoption of steel in place of iron is, of course, the superior character of the quality of the product. For many purposes where the greatest tensile strength is required, steel, by reason of its superiority in this respect, has been introduced, and as some of the difficulties in the way of its use, growing out of its low percentage of elongation, are overcome—and they have been to a great measure—this will be used to a still greater extent, especially for structural purposes. Indeed, it is rumored in the West that a Bessemer works already in existence there is to be changed so as to manufacture steel chiefly for structural purposes. But the chief reasons why steel is supplanting iron are the cheaper rate at which it can be produced, and the character of the labor required to produce it. As is well known, rails are selling to-day at \$35 a ton at the mill, while muck bar from puddled iron cannot be produced at much less than \$30. Muck bar is quoted at Philadelphia in your last report: "Sales at \$33 to \$33.50 at the mill"—\$1.50 to \$2 below the price of finished steel rails, while at Pittsburgh the quotation is \$32 to \$32.50. Indeed, it has been asserted again and again that finished rails will be produced in this country some time as low as muck bar can be produced. I do not think that this can be done to-day, but I have no doubt that it will be done in the near future. Now, this being so, it is evident that under the present conditions steel must supplant iron in many of its forms. Up to the steel bloom or billet but very little skilled labor is necessary, and a great deal of the work can be done by machinery, instead of the exercise of human power, and, consequently, the labor cost of the product is not liable to the fluctuations or to the contingencies that are connected with the manufacture of puddled iron. I have no doubt, also, that the refusals of the puddlers and other laborers in the West to accept lower rates have been the cause directly of the substitution of steel for iron in many cases.

There is not the least question that the constant labor difficulties, and especially the demand by the puddlers for 25 cents extra above Pittsburgh prices, are what has led to the determination of the Wheeling nail manufacturers to use steel instead of iron. A Bessemer converter never goes on a strike. The same thing is true also in regard to axle iron; the demand by some of the puddlers for \$1 extra for puddling iron to be used in the manufacture of axles has led to the substitution of steel for iron in this case also. It will no doubt be noted that the great extension of the use of steel for iron is in the West, where the prices for puddling, muck rolling and other similar work connected with the manufacture of puddled iron are very much above the prices ruling in the East, and we have no doubt that had better counsels prevailed in the West and lower prices been accepted, while it would have been impossible to have prevented the substitution of steel for iron, it would have very much delayed it. Respectfully,

A MANUFACTURER.

The Bartholdi Statue.

A meeting of the American Committee of the Statue of Liberty has been called by the Executive Committee, for the purpose of organizing immediate and efficient methods for raising the required funds. From the report of the Executive Committee it appears that they have thus far secured by voluntary subscriptions the sum of \$4,036.54, of which there has been paid out on contracts and in various miscellaneous expenditures \$19,591.06. The balance on hand will serve to complete the concrete work of the pedestal to a height of about 52 feet from its foundation, leaving only a small sum in the treasury. In order that the committee may proceed with their work at an early day in the spring, it is to the last degree important that the money required for the completion of the pedestal for the colossal Statue of Liberty be immediately raised. As the statue is finished and nearly ready for delivery, the contracts must be given out at once for the necessary stone, which must be quarried during the winter, if the work is to be prosecuted early in the spring. Otherwise it must be delayed for a year, or indefinitely. The sum of \$150,000 additional will be required to complete the pedestal in accordance with the approved design.

In order to secure compliance with their certainly very reasonable request, the Executive Committee have recommended to the General Committee the adoption of the following measures: "1. That each member of the General Committee be requested to solicit subscriptions from such of his personal acquaintances as he may think able and willing to contribute. 2. That a committee from each of the cities of New York, Brooklyn and Jersey City be appointed to make a personal canvass for subscriptions among the reputed men of wealth in those cities. 3. That a committee of three be appointed to consult with the several business committees appointed last fall, and to reorganize them for immediate and effective service. 4. That a committee of three be appointed to confer with the managers of theaters and other places of amusement, and with the authorities of military and other organizations, to arrange a series of benefits, balls, receptions, &c., in behalf of the pedestal fund. 5. That a committee of three be appointed to secure and execute various methods of small popular subscriptions through the Grand Army of the Republic, through trade and labor associations, and through local committees and individual exertions, whereby the mites of the people may be gathered, and every citizen of the Republic, whatever his means, be enabled to take part in this magnificent and patriotic enterprise." And they passed the following resolutions:

"1. That the reverend clergy of the several religious denominations be requested among the exercises of the coming Thanksgiving Day to mention the pedestal enterprise to their respective congregations, and

to recommend a generous subscription to its fund. 2. That a committee of three be appointed by the Chair to sit for two hours each day to carry out the provisions of this report, and to do such other necessary work as may seem to them advisable after consultation with the Executive Committee."

The report is signed by Mr. Joseph W. Drexel, the chairman of the Executive Committee, of which Messrs. Parke Godwin, J. W. Pinchot, V. Mumford Moore and Frederick A. Potts are the remaining members. The strange apathy which has thrown its pall over this enterprise is positively inexplicable. In the face of the—certainly justly—vaunted "American liberality" in the face of the fact that the gentlemen comprising the "American Committee" are not only deserving of, but, in fact, possess, the fullest confidence of every community in the United States, and notwithstanding our constant popular expressions of friendship and regard for France, our ancient ally and sister Republic, there is imminent danger of a shameful fiasco in the acceptance of this noble gift, for the want of the paltry sum which the committee mention as necessary for the completion of the pedestal. We are inclined to believe that this danger could be easily averted by more direct appeals than have hitherto been made, and trust that the working organization now proposed by the Executive Committee will meet with that measure of success which their zeal deserves and which our national pride demands.

The New Railroad Time.

Some idea of the changes of running time of the different railroads, about to be made by the adoption on the 18th of the four standards of time, may be formed by the partial list given below, the letter "f" denoting that the clock is to be set ahead, and the letter "s" that it is to be set back:

Atchison, Topeka and Santa Fé, east of Dodge City, clocks only, 9 minutes, f.
Atchison, Topeka and Santa Fé, west of Dodge City, clocks and schedules, 51 minutes, s.
Baltimore and Ohio (west), both clocks and schedules, 28 minutes, s.
Boston, Hoosac Tunnel and Western, both clocks and schedules, 4 minutes, s.
Boston and Albany, clocks only, 16 minutes, s.

Canadian Pacific (Eastern division), clocks only, 6 minutes, s.

Central Vermont, both clocks and schedules, 12 minutes, s.

Chesapeake and Ohio, both clocks and schedules, 8 minutes, f.

Chicago and Alton, clocks only, 9 minutes, s.

Chicago and Grand Trunk, both clocks and schedules, 9 minutes, s.

Cleveland, Columbus, Cincinnati and Indianapolis, both clocks and schedules, 28 minutes, s.

Delaware and Hudson Canal Company, clocks only, 4 minutes, s.

Delaware, Lackawanna and Western, both clocks and schedules, 4 minutes, s.

Fort Wayne, Cincinnati and Louisville, both clocks and schedules, 23 minutes, s.

Freehold and New York, both clocks and schedules, 4 minutes, s.

Hartford and Connecticut Western, clocks only, 4 minutes, s.

Lake Shore and Michigan Southern, both clocks and schedules, 28 minutes, s.

Lehigh Valley, clocks only, 1 minute, f.

Louisville and Nashville, clocks only, 16 minutes, s.

Missouri Pacific, clocks, schedules at St. Louis only, 8 minutes, s.

New York, Lake Erie and Western, clocks only, 4 minutes, s.

New York Central and Hudson River, clocks only, 4 minutes, s.

New York City and Northern, clocks only, 4 minutes, s.

New York and New England (east of Connecticut), both clocks and schedules, 14 minutes, s.

New York and New England (in Connecticut), both clocks and schedules, 4 minutes, s.

Pennsylvania (New York division), both clocks and schedules, 1 minute, f.

Pennsylvania (all divisions except New York), clocks only, 1 minute, f.

Philadelphia and Reading, both clocks and schedules, 1 minute, f.

Rome, Watertown and Ogdensburg, clocks only, 4 minutes, s.

The four standards of time will be known as the "Eastern Standard Time," "Central Standard Time," "Mountain Standard Time" and "Pacific Standard Time."

A novel steering apparatus is to be placed in the United States tug Nina. The apparatus is the invention of J. J. Kunstadter, a Hungarian, and it has been used with success in Europe. The shaft of the propeller is carried through the rudder-post, and there by means of a universal joint is connected with a shaft running through the rudder and having at its end a supplementary screw. The universal joint allows the rudder to move freely, and yet establishes a perfect connection between the main and the supplementary screws. It will be readily seen that when the helm is put to port or to starboard the driving power of the supplementary screw is brought into play to turn the vessel. The vessel is thus turned quickly in a small space. In cases where there is danger of collision and the engines are reversed, the vessel can be driven backward and completely out of her course in an exceedingly short space of time, as experiments have shown.

A new electric light intended for illuminating railway carriages has been patented in England by Mr. Cheesewright, and introduced by Mr. Gammon, of the London and South-Western Railway Company. The light is generated from a primary battery, which does away with the use of steam engines and dynamo machines. The batteries, which can be fixed under seats of carriages, can be charged for 20 hours. The dining-room car of the Leeds express train and South-Eastern Continental mail train have been successfully illuminated by this means, and the light has also been adopted by the Great Eastern and South-Western Railway Companies.

Proposed Commercial Treaty Between United States and Mexico.

The following tables, from a report by Consul-General Sutton, of Matamoras, to the State Department at Washington, show the articles proposed to be admitted free of duty into either country:

SCHEDULE OF MEXICAN ARTICLES TO BE ADMITTED FREE OF DUTY INTO THE UNITED STATES.

No.	Articles.	Duty.	Imports.	Duties paid.
(1) 1	Animals, alive, specially imported for breeding purposes.	Free.	Not stated.	
(9) 2	Bacon, per barrel.	1 cent.	\$6,365.	\$538.80
(10) 3	Beef, pound.	Free.	Not stated.	
(11) 4	Coffee.	Free.	\$1,817,584.	
(17) 5	Eggs.	Free.	\$305.	
(18) 6	Espresso and other grasses and pulp of for manufacture of paper.	Free.	Not stated.	
(14) 7	Flowers, natural, of all kinds.	Free.	Not stated.	
(15) 8	Fruits, all kinds of fresh fruits.	Free.	Est. \$30,000.	Est. \$4,000
	Oranges:			
	Box, 2½ cubic feet.	25 cents.		
	Half box.	13 cents.		
	Barrel.	55 cents.		
	Per 1000.	\$1.60.		
	Lemons:			
	Box, 2½ cubic feet.	30 cents.		
	Half box.	16 cents.		
	Per 1000.	\$2.		
	Oranges and lemons, n. e. s.	30 per cent.	Not stated.	
	Limes.	20 per cent.	Not stated.	
(26) 9	Goat skins, raw, without the wool.	Free.	Est. \$400,000.	
(10) 10	Henequen, Sisal, hemp, and all other like substitutes for hemp, per ton.	\$25.	\$2,067,676.	\$48,807.50
(11, 27) 12	Hides, raw or uncured, whether dry, salted or pickled, and skins, except sheep-skin, with the wool on, Angora goat-skins, raw, without the wool, and asses' skin.	Free.	Est. \$1,000,000.	
(18) 13	India rubber, crude and milk of.	Free.	\$164,847.	
(3, 19) 14	Indigo.	Free.	\$4,105.	
(20) 15	Isle, or Tampico fiber, ton.	\$15.	Est. \$250,000.	
(21) 16	Jalap.	Free.	Not stated.	Est. \$22,500
(12) 17	Leather, old scrap.	Free.	Not stated.	
(34) 18	Logwood, berries, aute, archil, and other vegetable dyes, or used for composing dyes.	Free.	Not stated.	
(23) 19	Molasses:			
	Not above 56°.	4 cents per gallon.	\$1,771.	About \$168.80
	Above 56°.	8 cents per gallon.	\$2.	
(1) 20	Palm or coconut oil.	Free.	Not stated.	
(4) 21	Quicksilver.	10 per cent.	Not stated.	
(30) 22	Sarsaparilla, crude.	Free.	\$8,628.	
(7) 23	Shrimps, and all other shell-fish.	Free.	Not stated.	
(24) 24	Straw, unmanufactured.	Free.	Not stated.	
(5) 25	Sugar, not above No. 16, Dutch standard in color, per pound.	1½ cents to 3½ cents.	\$102,147.	Est. \$75,000
(28) 26	Tobacco, leaf, unmanufactured, per pound.	35 cents, 75 cents and \$1.	\$31,150.	Est. \$18,487
(29) 27	Vegetables, per bushel:			
	Potatoes, per bushel.	15 cents.	Est. \$2000.	
	Other vegetables, fresh.	10 per cent.		\$120.70
(22) 28	Wood and timber of all kinds:			
	Unmanufactured.	Free.	Free \$490,776.	
	Manufactured, including ship timber, squared or sided.	10 per cent.	Dutiable, \$9.	\$1.80

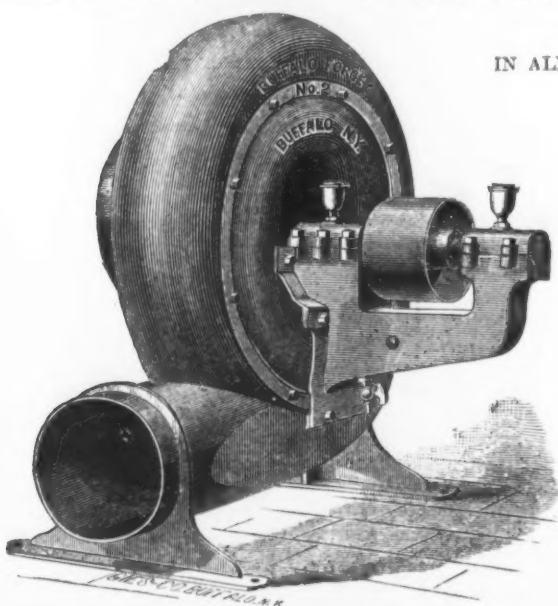
[Note.—The American tariff was changed July 1, 1883. The "duty" given is the new one. The "duties paid" are computed and are what would have been paid had the new tariff been in force during the period named. All dates are for the year ending June 30, 1882, unless otherwise specially stated. The amount and value of imports are taken from the Annual Report of the Bureau of Statistics of the United States, except when otherwise stated.]

SCHEDULE OF UNITED STATES ARTICLES TO BE ADMITTED FREE OF DUTY INTO MEXICO.

No.	Articles.	Duty.	Imports.	Duties paid.
			U. S. coin.	Mexican coin.
(1) 1	Accordeons and harmonicas.	Free and 50 cents.	Not stated.	
(74) 2	Anvils.	Free and 50 cents.	Not stated.	
(12) 3	Bars of steel for mines, round, &c.	Free and 50 cents.	Est. \$2000.	Est. \$304
(22) 4	Barrows and hand trucks.	Free and 50 cents.	Not stated.	
(36) 5	Bricks, all kinds.	Free.	\$692.	
(38) 6	Books, printed or bound.	Free and \$1.	\$27,254.	Est. \$1500
(73) 7	Booms and rafters of iron for roofs.	Free and 50 cents.	Not stated.	
(19) 8	Coal of all kinds.	Free.	\$76,022.	
(21) 9	Cars and carts with springs.	Carts, 2 wheels, ea. \$3.	Not stated.	
(23) 10	Coaches and cars for railways.	Free.	\$579,421.	
(24) 11	Crucibles and melting pots.	Free and 50 cents.	Not stated.	
(25) 12	Cane knives.	Free and 50 cents.	Not stated.	
(58) 13	Clocks, mantel or wall.	1 Kg. 80 and 75 cts. or 29 and 50 cents.	\$39,623.	Est. \$5000
(26) 14	Carriages, each.	\$66, \$88, \$132, \$176, \$366.	\$123,015.	Est. \$175,000
	Suggested definition in place of above:			
	Wagons and carts, each.	\$60 or \$38.		
	Diligences, carriages and wagons, all kinds.	\$60 or \$38 and 50 cents.		
(27) 15	Dynamite.	Free and 50 cents.	Not stated.	
(14) 16	Fire-pumps, engines and pumps.	Free and 50 cents.	\$13,475.	Est. \$1300
(40) 17	Faucets, per kg.	19 cents and 50 cents.	Not stated.	
(47) 18	Fruit and wick for mines.	Free and 50 cents.	Not stated.	
(53) 19	Feed, dry and straw.	Free and 50 cents.	Not stated.	
(57) 20	Fish, fresh.	Free and 50 cents.	Est. \$15,000.	Est. \$2500
(58) 21	Firewood.	55 per cent. and 75 cts.	Not stated.	
(23) 22	Fish, fresh.	35 per cent. and 75 cts.	Not stated.	
(30) 23	Guan.	Free and 50 cents.	None.	
(46) 24	Hoes, and their handles.	Free and 50 cents.	Not stated.	
(16) 25	Houses of wood or iron, complete.	Free and 50 cents.	Not stated.	
(17) 26	Hoes, common agricultural knives without sheaths, scythes, sickles, harrows, rakes, shovels, pick-axes, spades and mattocks.	Free and 50 cents.	Not stated.	
(66) 27	Henequen bags, of Mexican products.	55 per cent. and 75 cts.	Not stated.	
(81) 28	Ice.	Free and 50 cents.	None.	
(32) 29	Iron and steel rails.	Free.	\$60,260.	
(34) 30	Instruments, scientific.	Free and \$1.	Not stated.	
(35) 31	Lamps, per kg.	Free and 50 cents.	Not stated.	
(72) 32	Iron beams, per kg.	6 cents and 50 cents.	Not stated.	
(15) 33	Lime, hydraulic.	Free and 50 cents.	\$9,738.	Est. \$2,000
(30) 34	Locomotives.	Free.	\$647,117.	
(56) 35	Lithographic stones.	Free and 50 cents.	Not stated.	
(46) 36	Masts and anchors.	Free.	Est. \$40,000.	
(41) 37	Marble in blocks.	55 per cent. and 75 cts.	\$312.	Est. \$300
(42) 38	Marble in flags for pavements.	Free and 50 cents.	Not stated.	
(54) 39	Machines and apparatus of all kinds for industrial, agricultural and mining purposes, science and art, and any separate extra parts and pieces pertaining thereto.	Free and 50 cents.	Est. \$150,000.	Est. \$12,500
(48) 40	Metal, precious.	Free.	None.	
(50) 41	Money, legal, of silver or gold.	Free.	Not stated.	
(49) 42	Molds for casting the arts.	Free.	Not stated.	
(51) 43	Naphtha.	58 per cent. and 80 cts.	\$6,337.	Est. \$6,500
(40) 44	Oats, in grain or straw.	Free and 50 cents.	\$10,469.	Est. \$1,072
(44) 45	Oars for small vessels.	Free and 50 cents.	Not stated.	
(45) 46	Plows and plowshares.	Free.	See No. 40.	
(52) 47	Paper tarred for roofs for the arts.	Free and 50 cents.	Not stated.	
(57) 48	Plants and seeds for cultivation.	Free and 50 cents.	\$1,569.	Est. \$75
(58) 49	Pens, of metal, not gold.	G. Kilo, 80c. and 75c.	Not stated.	
(50) 50	Petroleum, crude.	88 per cent. and 80 cts.	\$3,705.	Est. \$3,035
(60) 51	Petroleum and coal oil.	(No leakage; net weight per kg. 9 and 50 cents.)	\$285,115.	\$472,045
(62) 52	Powder, common.	Free and 50 cents.	Est. \$100,000.	Est. \$1,136
(10) 53	Quicksilver.	Free.	\$316,714.	
(70) 54	Rags, paper.	Free and 50 cents.	None.	
(67) 55	Roots of all kinds.	Per M. \$195 and 50 cts.	Not stated.	
(11) 56	Sulphur.	Free and 50 cents.	Not stated.	
(18) 57	Stoves of iron.	(Kg. 29 and 50 cents, or K. 19 and 50 cents.)	\$9550.	Est. \$9000
(28) 58	Staves and headings for barrels.	Free and 50 cents.	\$4503.	Est. \$225
(33) 59	Soda, hyposulphite of.	Free and 50 cents.	Not stated.	
(49) 60	Steam engines.	Free and 50 cents.	\$27,726.	Est. \$2550
(44) 61	Sewing machines.	Free and \$1.	\$305,595.	Est. \$15,000
(65) 62	Sausages, wire.	24 cents and 50 cents.	Not stated.	
(30) 63	Teasels of net.	Free and 50 cents.	Not stated.	
(55) 64	Tools and instruments of steel, iron, brass or wood, or composed of these materials for artisans, per kg.	G. wt., 19 cts. and 50 cts.	Est. \$200,000.	Est. \$25,000
(69) 65	Types and accessories for printing of all kinds.	Free and 50 cents.	Est. \$15,000.	Est. \$1500
(71) 66	Vegetables, fresh:			
	Potatoes and onions, per kg.	2 cents and 50 cents.	\$39,156.	Est. \$4000
	Other vegetables, fresh.	Free and 50 cents.	Est. \$5000.	
(2) 67	Wire, telegraph.	Free and 50 cents.	Not stated.	
(3) 68	Wire, of iron or steel, from No. 26 upward.	Free and 50 cents.	Not stated.	
(4) 69	Wire barbed for fences and the hooks and nails to fasten the same, per kg.	G. wt., 2 cts. and 50 cts.	Not stated.	
(18) 70	Water-pipes of all materials.	Free and 50 cents.	Not stated.	
(52) 71	Window blinds, per kg.	G. wt., 29 cts. and 50 cts.	Not stated.	

[Notes.—All dates are for year ending June 30, 1882, unless otherwise specially stated. The amounts and value of imports are taken from the Annual Report of United States Bureau of Statistics, unless otherwise stated. All metric denominations have the American equivalent in parenthesis or below. The Mexican tariff is of three sorts: First, the principal or regular duty, which is the one usually given; second, an additional duty of 2 per cent. on the previous duty; third, a weight duty from 50 cents to \$1 on each kg. (220 pounds), gross. Where this weight duty is of importance I have calculated the duties and marked them "Est." The executive has lately been authorized to increase all duties 5 per cent. Articles marked "Free" are

NEW AND IMPROVED Buffalo Exhausters,



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For Planing
Mills,
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Purposes, &c.

Superior to any
other make.

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BOILERS and PIPES, Refrigerators, Meat Cars, Ice Houses and Hot and old Water Pipes. Easily applied by any one.

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THE LIVINGSTON HORSE NAIL COMPANY,

104 Reade St., NEW YORK.

MANUFACTURERS OF THE

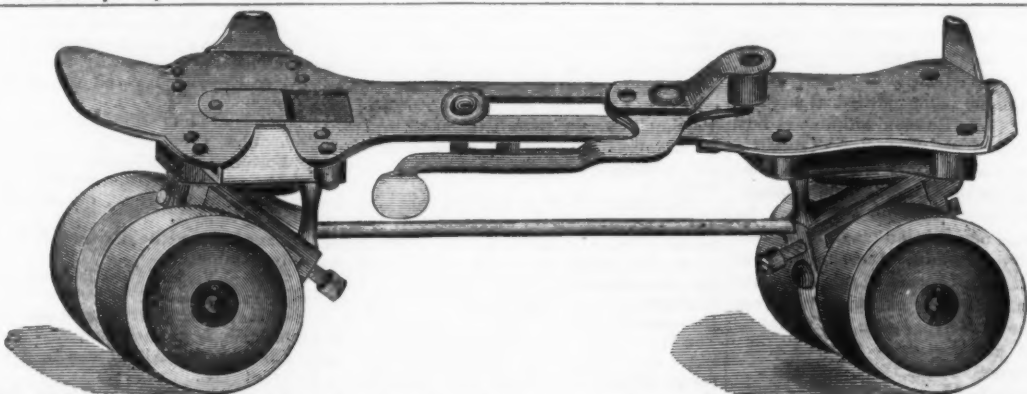
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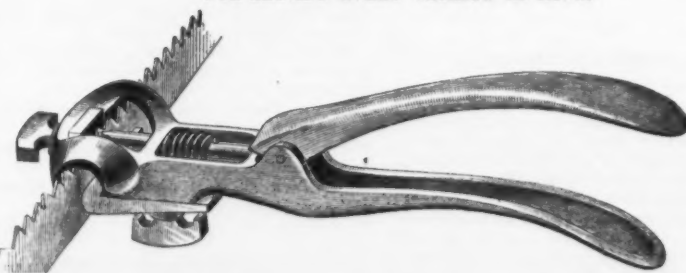
And will Hold a Shoe Better than any Nail Made.



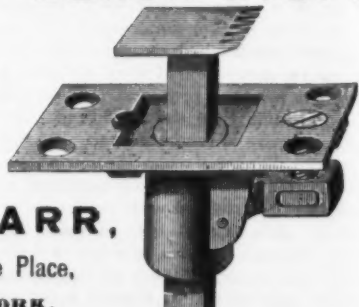
We now offer our New Patent Self-Adjusting Lever Rink Roller Skate, with foot plate and working mechanism made of crucible steel, blued or nickel-plated. Malleable Iron Trucks, Adjustable Rubber Springs, Steel Axles and Boxwood Wheel. This is the best Guideable Rink Skate ever offered to the public. We also manufacture the Standard Scientific and New Rink Roller Skates, with wood tops, also New York Roller Skates. Our Illustrated Catalogue for 1883, showing the most complete line of Roller and Ice Skates ever offered to the trade by any manufacturer, will be mailed on application.

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STEEL TOE CALKS,
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NO OIL
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Made of Wrought Iron (except the Wheel, which has a Steel Axle) in a thorough manner, of sufficient strength to sustain the heaviest door.
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Pennsylvania Steel Co., Pa.
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E. H. Coleman, Lebanon, Pa.
Chester Rolling Mill Co., Pa.
Davenport, Fairbairn & Co., Pa.
Isabella Furnace Co., Pa.
Faxon Furnace Co., Pa.
Spears Iron Co., Pa.
Kline Iron Works, Ohio.
Milton Coal and Iron Co., Ohio.
Wisconsin Furnace Co., Ohio.
Moss & Marshall, Ohio.
H. Campbell & Sons, Ohio.
Hocking Valley Iron Co., Ohio.
Cleveland Rolling Mill Co., Ohio.
Meier Iron Co., Ill.
North Chicago Steel Co., Ill.
Union Iron and Steel Co., Ill.
Means & Culbertson, Ky.
Lakeland Furnace Co., Ky.
Barton Iron Co., Ky.
Southern States C. I. and S. Co., Tenn.
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RUSSIA CEMENT CO. GLOUCESTER, MASS.

AWARDED THE
GOLD MEDAL
AT THE
INTERNATIONAL
EXHIBITION,
London, 1883.

INDUSTRIAL ITEMS.

MASSACHUSETTS.

The manufacture of files is soon to be commenced at Chiltonville by S. Hamblin, who invented a file machine and organized a stock company, to which he sold his patent, in Pittsburgh. Since then he has been devising a machine that would make a file in every way similar and as good as a hand-made file, and he believes that he now has achieved that desirable result. He has at his shop in Chiltonville one of these machines running by hand-power to demonstrate the fact.

It is expected that the new watch factory at Williamstown will be in operation by January 1. Over 100 operatives will be employed, many of them coming from abroad.

CONNECTICUT.

The Wilson Sewing Machine Company, of Wallingford, have 2000 machines nearly finished, and expect to turn them out at the rate of 50 per day during the coming month.

NEW YORK.

Chrome Steel Works, Brooklyn, E. D., are making a combination chrome steel suitable for safes, jails and deposit vaults. The demand for this specialty of steel has been so great that they have recently put in a new 200-horse-power engine. They employ 150 men, and their sales for this year so far are largely in excess of last year.

PENNSYLVANIA.

The shops of the Philadelphia and Reading Railroad Company, in Reading, are very busy, every track in the machine shop being filled with engines undergoing repairs. There is no probability of a suspension in that department during the winter.

Messrs. Reis Brothers, of Newcastle, have sold their interest in Neshannock Furnace to A. L. Crawford for \$95,000. Mr. Crawford holds it until the organization of a company, which is now under way, is completed. The rebuilding of the furnace is rapidly nearing completion.

Lucy Furnace, at Orbisonia, Huntingdon County, will blow out soon on account of unremunerative prices of iron. The owner is John Whitehead, the coal operator of Orbisonia.

A serious accident occurred on the morning of the 7th inst. at the Philadelphia and Reading Coal and Iron Company's Knickerbocker Colliery, near Shenandoah, which resulted in the instant death of one man and the injury of a number of others. William Wagner, who was assistant master mechanic of the coal and iron shops at Pottsville, on that morning, with several of his men, made a trial of some new machinery. About 11 o'clock the engine was running, and everything apparently in good order, when suddenly a terrific report was heard. An examination of the engine-house was subsequently made, when it was ascertained that the huge fly-wheel of the engine had burst, almost completely demolishing the new buildings.

PITTSBURGH AND VICINITY.

Wilson, Snyder & Co., of this city, have brought suit against the Manchester Iron and Steel Company for non-fulfillment of contract. The plaintiffs claim that the company, its directors and its stockholders, are all liable.

Last Thursday the Pittsburgh Steel Casting Company made a successful experiment in rolling shaped blooms for deck and I-beams from square ingots weighing 2600 pounds each, thus reducing the section from 125 square inches in the ingot to 54 square inches in the shaped bloom. They were just 60 minutes in accomplishing this, in which time the cast iron was finished into a steel bloom. They claim that with additional machinery it could have been shaped into a finished beam in less than 15 minutes. This is the first successful experiment of the kind ever heard of, and will be of great importance as an experiment in the structural steel trade of the United States.—Commercial Gazette.

The Fuel Gas Company, of which Dr. Hostetter is the head, are pushing the work of laying pipes on Second avenue, and if not interrupted by bad weather will soon have it completed. The company have received a number of applications from glass, steel and iron manufacturers of the South-side to lay pipe to their mills, and it is altogether probable that a large pipe will be laid across the Monongahela River, somewhere near the railroad bridge.

OHIO.

The Maumee Rolling Mills, at Toledo, are being rapidly got into shape, and will begin operations before long. The main building, 362 feet in length by 100 feet in width, is completed. Either side of this structure, extending the full length, are sheds 50 feet wide, which afford a space under cover 362 x 200 feet. The main machine shop, 32 x 65 feet, and the molding room, 50 x 64 feet, are fully completed.

The Youngtown Electric Light Company have had a charter granted to them, and as soon as possible will perfect the organization of the company. The incorporators are A. W. Jones, Lloyd Booth, Frank Wood, D. B. Stambaugh and George Margerum, the capital being placed at \$60,000, which has been guaranteed as soon of the stock hooks are opened. They propose to manufacture and sell the Thompson-Houston electric light.

The Union Rolling Mill Company, Cleveland, have just built three new puddling furnaces as an addition to the Aetna Mill.

The forge at the Kelly Iron and Nail Works, Ironton, started up full last week, and 14 furnaces are now running double turn. The nail factory will be in full operation next week.

A large casting house has been built by the Ohio Iron and Steel Company, at Mary Furnace, Lowellville.

It is reported that the owner of the Hall Rolling Mill, in Hubbard, has decided to sell it and devote his entire attention to the coal trade.—Youngstown News-Register.

The Youngstown Car Manufacturing Company have all the orders they can fill until after January.

The Lane & Woodworth Glass Roofing Works have shut down on account of being unable to secure a sufficient number of employees.

ILLINOIS.

A disastrous fire at LaSalle destroyed two of the furnace houses of the Destiegar Glass Works on the morning of the 5th inst. The total loss is estimated at \$50,000, against which there is insurance of but \$7500. One hundred and fifty men are thrown out of employment by the fire. It is hoped that the mammoth Siemens tank is but slightly injured, but its condition has not yet been ascertained, owing to its great heat. It is 18 x 4 feet in size and filled with 200 tons of molten glass.

The Chicago Die and Machine Works have just shipped a large and improved car-wheel grinding machine, weighing 7 tons, to the Northern Pacific Railroad. Preparations will be made at once for extending and improving the plant of this company.

Chamberlain, Cox & Miller, of Chicago, in addition to the number of manufacturers and general hardware firms which they already represent, have recently been appointed agents for the Findlay Stave and Handle Company, of Findlay, Ohio.

For the past six weeks the Northwestern Horse Nail Company's works have been running 12½ hours per day, 70 machines being in operation. During October 190 tons of finished nails were made by the company. Ten additional machines are being built for these works.

The pattern shop of the Illinois Iron and Bolt Company's works, at Carpentersville, which was destroyed by fire on the 19th of August last, has been rebuilt. This company have also added to their foundry a new cupola having a daily capacity of 50 tons. The works are quite busy, and numerous orders for export are being filled.

The stockholders of the Union Iron and Steel Company were to have held a meeting at their office on the 13th inst., for the purpose of making a transfer of the concern to the new syndicate.

The W. F. & J. Barnes Manufacturing Company, of Rockford, are adding a large foundry to their works. This additional structure will be 50 x 150 feet. They report business as very brisk, and are making a large shipment of their goods to Australia.

MISSOURI.

The new light rail mill and the two new Siemens gas-consuming furnaces of the St. Louis Bolt and Iron Company, at East St. Louis, will be started up next week. The new rail-mill department is distant some 300 feet from the old works and represents an investment of about \$50,000. The rolls used at the works are interchangeable.

The Deane Steam Pump Company—St. Louis office—have lately put in two 14 x 7 x 16 inch pumping engines at the Springfield Water Works, a 7 x 4½ x 8 inch pumping engine at the establishment of the Keokuk (Iowa) Plow Works, and a 14 x 8 x 12 inch double-plunger pump for parties at Webb City. Their condensing apparatus has recently been put in the works of the Desloge Lead Company, at Bonne Terre, in the factory of the Quincy (Ill.) Paper Company, and in the establishment of E. W. Sparks, Alton, Ill. The company now have six or seven water-works contracts on hand, and are quite busy both here and at their factory. At that establishment they now have under way some very large pumping engines, one for the Lynn (Mass.) Water Works, with a daily capacity of 6,000,000 gallons, and another for the Syracuse (N. Y.) Water Works, capable of throwing 3,000,000 gallons a day.—St. Louis Age of Steel.

INDIANA.

The works of the "C" Spring Cart Company, of Rushville, were destroyed by fire on Wednesday night, 31st ult. It proved a total loss, with the exception of some 20 carts. An invoice of stock, taken last July, showed \$14,000, besides buildings. The total insurance on stock and buildings was \$10,000. The loss above the insurance will be between \$7000 and \$8000. The company, who will rebuild immediately, expect to be operating in about two days on an enlarged scale, after which all orders will be promptly filled.

Failure of the Danville Steel Company.—Reports received in this city last Thursday stated that the Danville Steel Company, of Danville, Pa., had become embarrassed, and 15 judgments for \$93,074 had been entered against it, upon which execution was issued to the sheriff. The company had been in operation since 1870, and had a paid-in capital of \$103,500. The property cost over \$250,000, and \$50,000, it is said, was expended in altering the plant to manufacture steel by the Siemens-Martin process. Peter Baldy is president, and L. K. Rishel, treasurer. The establishment owed its origin to a number of practical ironworkers who were desirous of experimenting with the co-operative idea. The company was formerly called the Co-operative Iron and Steel Works, and the name was changed October 9, 1883, to the Danville Steel Company. Peter Baldy, the president, is also in the dry-goods business, and his failure is reported, with liabilities of \$112,000. Judgments for over \$69,000 have been entered against him.

A French inventor who has patented a machine for the use of concentrated solar rays as a general motive power has set up three of his machines in Algeria for the French Government. He is now carrying on experiments at the Island of Porquerolles, near Hyeres, in France, where he is thrashing Indian corn and raising water by the action of the sun's rays.

The authorities of Geneva are at present considering a project for lighting the city by electricity, deriving the necessary power from the current of the River Rhone. Their report will be ready for presentation in a short time, and, if considered practicable, work will be commenced immediately.

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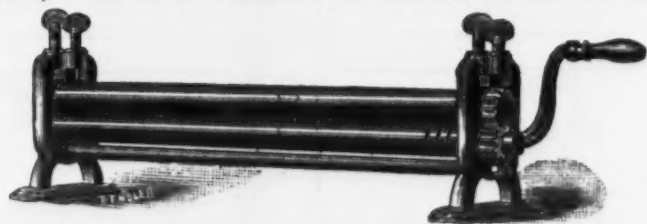
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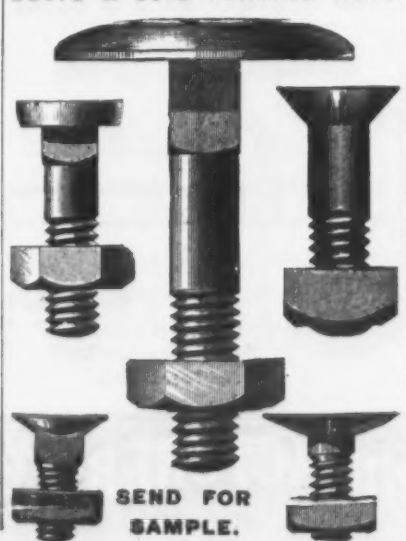
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WASHINGTON NOTES.

(From Our Own Correspondent.)

WASHINGTON, D. C., Nov. 14, 1883.

The elections having been disposed of, the approaching session of Congress and the Speakership are beginning to attract general attention. The unexpected turn in public sentiment indicated in the results in Pennsylvania, New York and Connecticut, and the political straws showing the direction of the winds of popular favor in other localities, will have more or less influence in shaping the organization of the House of Representatives on the basis of agitation or no agitation of the tariff.

THE SPEAKERSHIP.

The friends of the principal candidates for the Democratic Speakership are already in the field, and are naturally full of enthusiasm for their chosen candidates. Their calculations are in most cases the merest froth. Of the principals in this contest, ex Speaker Randall has been in the city for some time, and is managing his own affairs in person, and with his usual adroitness and tangible results. Mr. Carlisle arrived several days ago, and on the way are Messrs. Morrison and Springer. Mr. Cox will be here in a few days. Senator Beck and other notorious free traders of the Senate and House are either already in the city or will be here shortly, to take a hand in support of Carlisle. The contest, notwithstanding the would-be candidates and dark horses, has narrowed down to Randall and a conservative tariff policy, and Carlisle and a reopening of the question and an aggressive course in support of free trade. The object in either case has reference to the approaching Presidential campaign. The Randall men believe that a do-nothing course would strengthen the party before the people, particularly in the West and South, and the Carlisle men assert that popular sentiment is in favor of their own ultra views, and that what would be gained in the manufacturing States by a conservative course would be more than counterbalanced in the agricultural States by an advanced position in favor of free trade.

SPEAKERSHIP FIGURES.

There has been considerable figuring on the prospective vote of the Democrats of the House on the question of candidates. The predilections of the parties generally shape the results. As a sample of these calculations it may be stated that the Carlisle men concede Randall the following vote: Alabama, 3; Arkansas, 1; Connecticut, 3; Delaware, 1; Florida, 1; Georgia, 1; Indiana, 1; Louisiana, 3; Maryland, 4; Massachusetts, 1; Mississippi, 1; Missouri, 1; Nevada, 1; New Jersey, 2; New York, 1; North Carolina, 1; Ohio, 2; Pennsylvania, 12; South Carolina, 1; Tennessee, 1; Texas, 2; Virginia, 2; West Virginia, 1; making a total of 50. On this basis the Carlisle men tickle their hopes with the fact that there still remain 100 votes, and that 95 would be required to nominate. According to this Mr. Carlisle will require the entire residuum of votes, minus four. To less enthusiastic individuals this would be regarded as rather a slim chance, as Mr. Cox claims a few votes at least.

SPECIMEN CALCULATIONS OF RELATIVE STRENGTH.

The mildest estimate, however, is one which has been very generally circulated showing the relative strength of candidates as far, it is claimed, as the members have committed themselves, as follows: Carlisle, 34; Cox, 13; Randall, 11; Springer, 2; non-committal, 65, or about 50 short of the probable vote in caucus. The absurdity of this statement is shown in the fact that the strength conceded to Randall is less than that which has been tendered to him in his own State, and his friends at the same time concede a larger vote than that claimed for Carlisle. It will be seen by this that the friends of the rival candidates, thus early in the game, are indulging in a little bluff in the absence of any authenticated facts. The question might be added, what has become of the 50 written proffers of support which Mr. Randall had received up to last May? He and his friends are quiet and confident, which leads to considerable anxiety on the part of his antagonists, the field.

PROSPECTIVE TARIFF AGITATION.

It looks now as if the tariff question would lead to some lively parliamentary conflicts, no matter which way the Speakership turns. A large and influential element in the Democratic party is in favor of reopening the tariff question. Among the Republicans the general sentiment of the party is opposed to reviving the agitation, though there are many who desire an adjustment of the wool question at least on the basis of the old duty. These facts may open the way, and, once open, it would be impossible to say where the matter would end.

THE REPUBLICAN COMPLIMENTARY VOTE.

The complimentary vote of the Republicans for the Speakership will be given to ex-Speaker Keifer.

Adjustable Sieves.—All who have occasion to employ sieves for different purposes are aware of the necessity of using those with different meshes in order to accomplish the sorting of grain, seeds and other materials in the most satisfactory manner. The idea of a sieve so constructed that the mesh can be changed at will, without the necessity of removing the material from it, is one that must commend itself to all who have occasion to use such an article. The Milton Sieve Company, Limited, Milton, Pa., are manufacturing an article of this kind. Instead of having a round form, as is customary with many kinds of sieves, this has a square or rectangular rim, and the change in the mesh is caused by jointed corners of the rim, by which it can be compressed so as to be diamond or lozenge shape, instead of square. Of course, each intersection of the wires forming the mesh of the sieve is correspondingly affected, and therefore the mesh is changed in a proportionate degree by changing the shape of the sieve. One corner of the sieve is provided with a segmental shaped gauge, by which the sieve can be held in any desired position, or, in other words, the mesh main-

tained of any desired size. The manufacturers state that sieves of this kind will separate rye from wheat, and clean grain from cockle and all foreign seeds. The statement is also made that they will clean clover seed from the various weeds with which it may be mixed. It is especially desirable for cleaning garden seeds.

The Bochum Steel Works.

Messrs. Woltman & Mickerts, of 78 William street, New York, sole agents for the United States of the Bochum Mining and Steel Works, of Bochum, Westphalia, have favored us with a catalogue giving some very interesting particulars relative to the above establishment. It is furnished with numerous engravings illustrating the general arrangement of the various departments, and also the accommodations for the workmen, but we regret that the extensive character of this particular portion precludes the possibility of here giving it the attention it merits. The following brief abstract, however, will undoubtedly prove interesting: The steel works were erected some 40 years ago, and, though having assumed but moderate proportions in the first 27 years of their existence, now occupy a prominent position. The number of workmen now employed amounts to 4600, to which, however, should be added those engaged in the coal and iron mines, bringing the total number up to 6400. The greater proportion of the fuel employed in the works is obtained from the Maria Anna and Steinbank Colliery, about a half mile distant, railroad communication facilitating the transportation of the materials. The output amounts to something like 250,000 tons per annum, and the coal is reported to be of a remarkably good quality, containing from 4 to 5 per cent. ash. The colliery furnishes employment for 1040 men.

The iron-ore mines in the Siegen and Nassau districts produce no inconsiderable proportion of the total quantity consumed in the company's blast furnaces. The spathic iron-ore mines at Kirchen are considered specially valuable, yielding an annual output of from 40,000 to 60,000 tons. Two of the coke blast furnaces, situated near Muhlheim, on the Rhine, and formerly producing 50,000 tons per annum, are now out of blast, while three others at Bochum of larger capacity are now regularly turning out 120,000 tons a year. A large number of coke ovens are in operation both in Bochum and at the Maria Anna and Steinbank Colliery. The product of the steel works comprises crucible, Bessemer, Martin and basic steels, and ingot iron, and the forge is equipped with 38 steam hammers. The Bessemer department contains six converters, and the output is worked up principally into rails. Twelve locomotives and 350 cars serve for transporting materials, and the total length of track in use amounts to about 18 miles. Motive power is furnished by a large number of steam engines developing about 8000 horse-power, steam being supplied by 18 boilers, and, in addition, the works are well supplied with hydraulic apparatus.

Trying to Beat the Record.

Although an exceptionally large output or unusually rapid work is more naturally expected of iron and steel works in times of brisk demand and high prices, yet instances of that character are not uncommon in this country, even in these days of dull trade and hesitating demand. Our iron and steel works managers have not lost their spirit of emulation, and are evidently as anxious as ever to distinguish themselves by their industrial achievements. Two praiseworthy cases of this kind have come under our notice this week, one being a large output of pig iron and the other being very rapid work in the conversion of Bessemer steel.

The Crane Iron Company, of Catsauqua, Pa., had only three of their five furnaces in blast in October, but turned out 4354½ gross tons of No. 1 foundry iron, 900 tons of No. 2 foundry, and 138 tons of No. 1 mill, or 5392½ tons in all, being an average of nearly 1800 tons per month to each furnace. The fuel used was anthracite coal, except in the case of one furnace, in which the fuel used was one-fourth coke. The ores were native Lehigh County hematites and New Jersey magnetites, one-half each. As the Crane Iron Company were the first to make anthracite pig iron successfully as a regular product in this country, the record here given shows that they were not deficient in enterprise in their mature years, but are keeping up very well with their competitors. The credit of much of the good work of the Crane Iron Company is due to Mr. Joseph Hunt, the efficient furnace superintendent.

The converting department of the Scranton Steel Company, of Scranton, Pa., on the 9th inst., with two converters, made 60 heats in 11 hours and 45 minutes, which is a little better than five heats per hour. It is believed that this number of heats has never been equalled in the same time anywhere in the world, with two converters. Many of the heats were made in 10 minutes each. It is also worthy of note that one of the converter bottoms used on the day referred to made 42 heats, which is perhaps the best service ever obtained from one converter bottom.

The Belgians, in these days of close competition, have lost none of their former commercial push in utilizing foreign markets. Not only South America, but Asia and Australia, bear testimony to their enterprise. Take, for instance, the Belgian Exportation Company, which was formed two years ago to promote trade with Polynesia; we see that from a turnover of \$3,000,000 during the past year, a profit of \$149,540 has been realized. A dividend of 10 per cent. has been declared, and it has been decided to double the capital of the concern.

The Director General of the World's Industrial Cotton Centennial Exposition at New Orleans has invited designs for the main building, which is to embrace 1,000,000 square feet. The floor space is to cost \$250,000. Plans will be received until noon of November 25. The premiums offered are \$1000 for the best plan, \$500 for the second, and \$250 for the third.

NEW PUBLICATIONS.

MECHANICS OF ENGINEERING AND OF MACHINERY. By Dr. Julius Weisbach. Vol. III. Part I. Section I. Mechanics of the Machinery of Transmission. Translated by J. F. Klein, of the Lehigh University. Size, 6 x 9 inches; 544 pages; 443 illustrations. Bound in cloth. Published by John Wiley & Sons. Price \$5.

This volume is the first installment of the second edition of what was formerly known as Volume III of Weisbach's "Mechanics of Engineering." So much new material has been added by Professor Herrman, and the material of the first edition so thoroughly classified, revised and the discussions improved, that it practically constitutes a second edition. Each of the three volumes is as large as the original Volume III. The divisions are now: Part I, Mechanics of Transmission; Part II, Mechanics of Machinery for Lifting and Transporting Solid and Fluid Materials, and Part III, Mechanics of Machinery for Changing the Form and Size of Materials. The introduction, covering 58 pages of fine type and embracing 33 cuts, is devoted to kinematics as essential to the remainder of the work. The author treats it as pure mechanics, and it has special relation to the theory of transmitters given in the volume. In looking it over it really becomes a question whether this portion in future editions may not be considerably expanded and take its place in the series. The work covers almost everything in the way of mechanical movements. We notice among the leading chapters journals, shafting, couplings and bearings—couplings including everything from drag-links and universal joints to friction clutches and ratchet-wheels. In journal-boxes and pillow-blocks a variety of styles, embracing the best foreign practice, are shown. Steps and upright bearings can hardly be considered satisfactory. The chapter on gearing is full, and embraces skew, bevel, differential, non-circular and friction-wheels; belts, belt pulleys, tighteners, guide belts, &c., have considerable space to themselves. Rope and belt gearing, as it deserves, gets considerable attention. The same is true of stepped cones and conical drums. The general subject of spur-wheels, toothed surfaces, forms of teeth and their development are treated at great length. Almost every phase of the subject seems to be considered. About 125 pages are devoted to it. Guiding mechanism, especially the so-called parallel motions, receives an amount of space and attention out of all proportion to its value. After describing nearly every parallel motion that has been proposed within the past hundred years, it takes up and discusses Peaucellier's linkage, and concludes by saying: "It is the only known system of links which converts an oscillating circular motion into an exact rectilinear motion without the intervention of slide bars." In view of this remark, and the fact that the object of a parallel motion is to secure movement in a straight line, it would seem that a large portion of the matter under this head was superfluous, to say the least. Those who have seen the top of a piston-rod furnished with a Watt parallel motion making a figure 8 in the air and wearing on alternate sides of its stuffing-box, will hardly consider an approximation to a straight line of sufficient value to make it worth discussion. The remainder of the work covers a variety of topics involving the same general principles. Taken as a whole, it is a very satisfactory chapter in the series. Illustrations and printing are both excellent.

THE ELASTICITY AND RESISTANCE OF THE MATERIALS OF ENGINEERING. By William H. Burr, C. E. Published by John Wiley & Sons. Size, 6 x 9 inches, 7-8 pages; numerous illustrations; bound in cloth. Price, \$5.

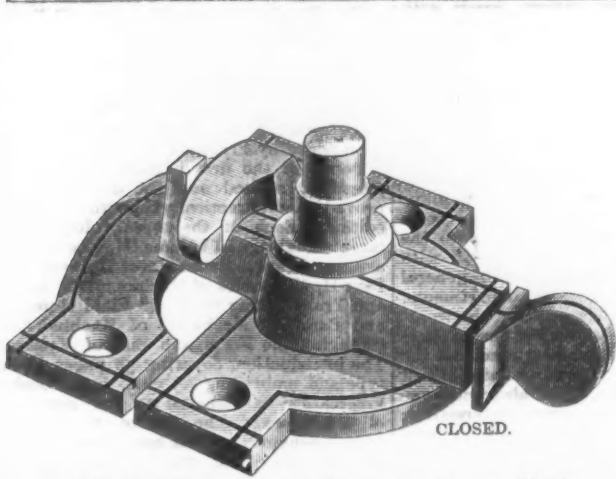
This book is an outgrowth of the Professor's lectures on elasticity and resistance of materials, given to the students of the Civil Engineering Department at the Rensselaer Polytechnic Institute. Very naturally, they have been elaborated and extended, and made to cover the details of the subject not included in any technical course of study. The work is divided into two parts. The first includes the theory of elasticity in solid bodies, hollow cylinders, thick hollow cylinders and spheres, and torsion, theory of flexure, &c. The theory or technical part is developed in Part 2. The first part of the work is designed for technical students, especially for those whose tastes and circumstances require investigation in connection with the elasticity and resistance of materials. In Part 2 the author says the mathematical results obtained in the first portion are subjected to the tests of experiment. These, of course, are compilations, but have been taken in all cases, so far as the author knows, from the most trustworthy sources. In every case, so far as we have looked, the author has with the utmost care given credit where credit has been due. In the production of this part of the work the author has evidently reduced to shape a vast amount of experimental material, changing the crude record of tests to a useful form, and reducing from one unit to another in order to make the work harmonious throughout. Much of the matter, although credited to other authorities and to other authors, is substantially new, having been worked over and put into a shape to be practically useful to the engineer without the excessive labor which would be necessary in turning to the original authorities.

RECENT WONDERS IN ELECTRICITY, ELECTRIC LIGHTING, MAGNETISM, TELEGRAPHY AND TELEPHONY. By Henry Greer. Size, 8 x 10 inches; 108 pages; numerous illustrations, paper covers. Price, \$2.

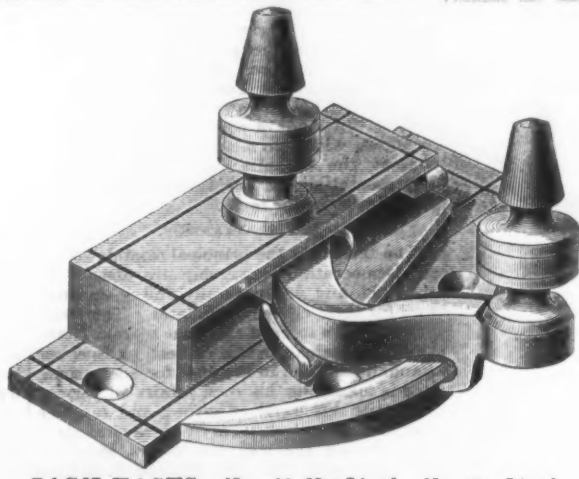
We are at a loss how to describe this pamphlet, or how to give an idea of its contents. It seems to be largely made up of extracts from various newspapers, together with photo-reproductions of the cuts that accompanied them. The price is out of all proportion to the value of the work to the general public or to the electrical engineer. We have previously mentioned a smaller work of a similar character by the same author, and having the same title. This seems to be the same work with additional extracts.

A vessel lately brought 2600 tons of iron ore from Greece to Philadelphia for the Pennsylvania Steel Works. This ore came from the Island of Seriphos.

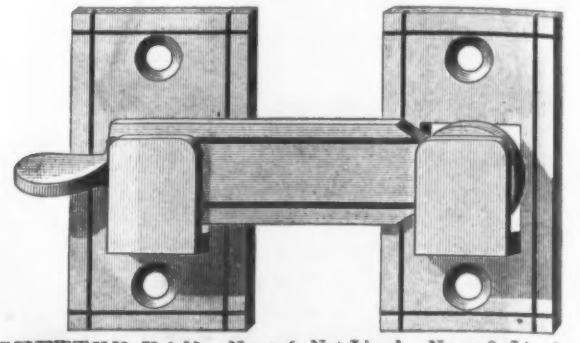
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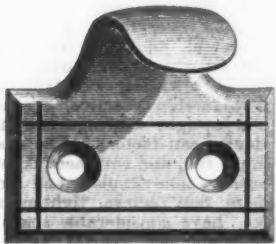
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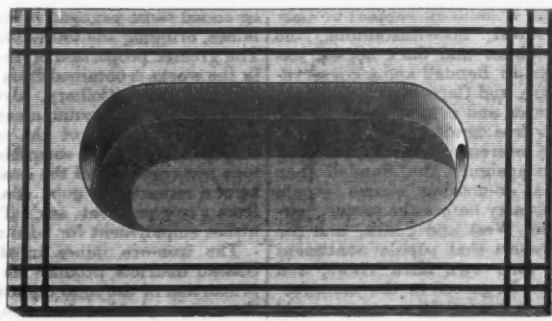
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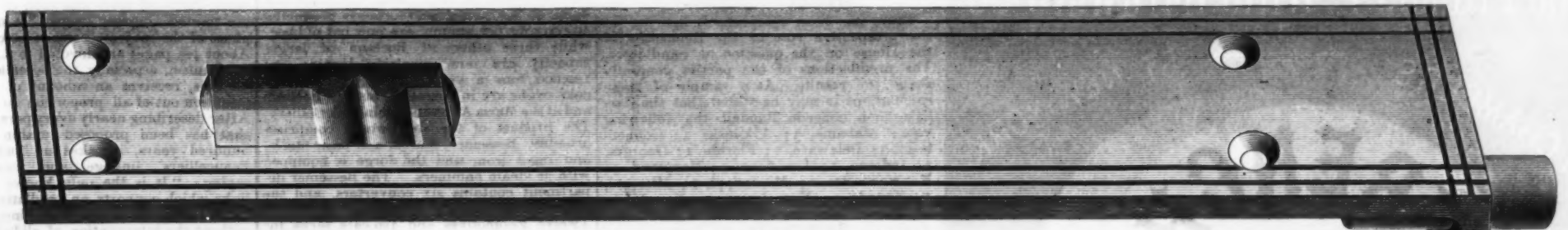
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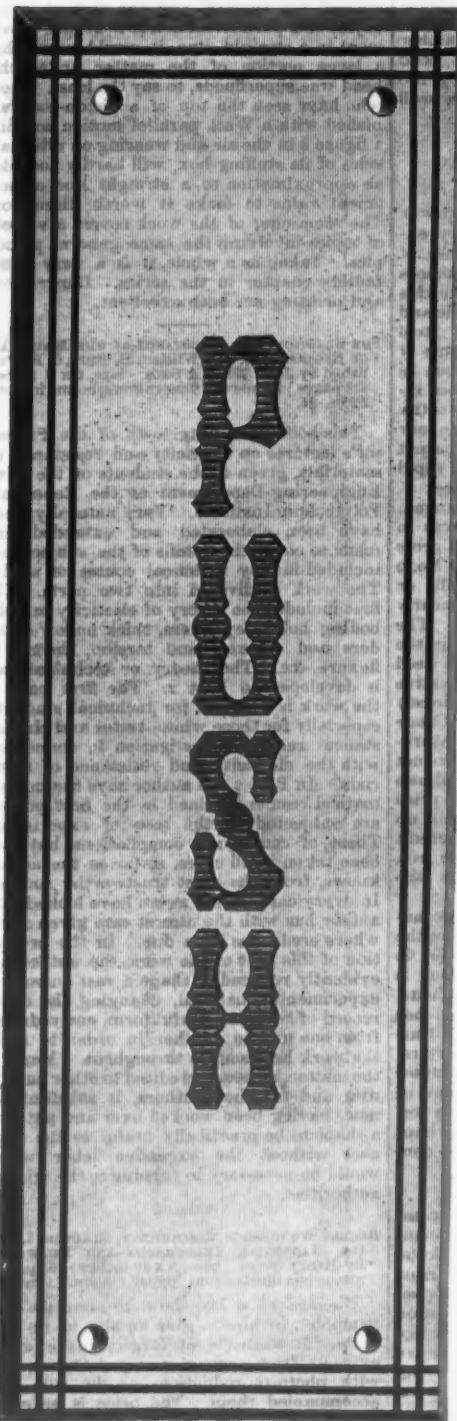
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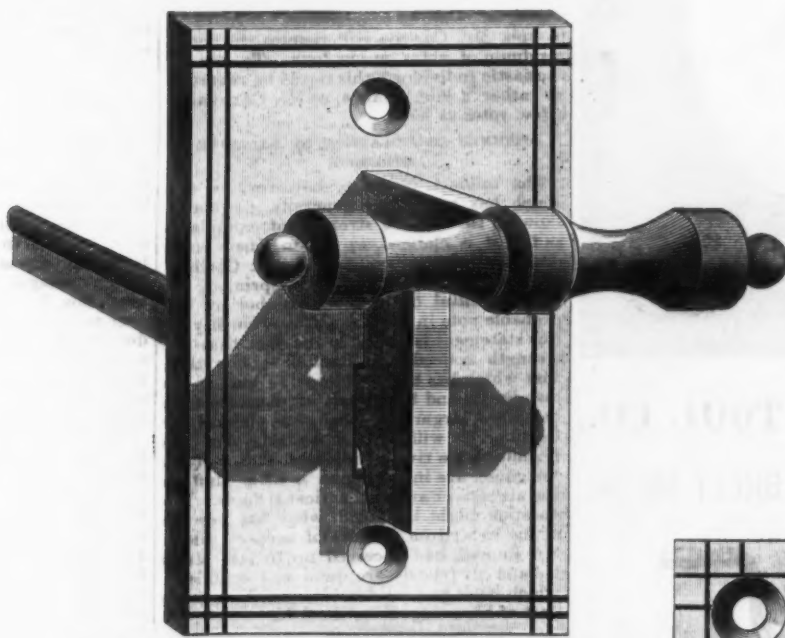
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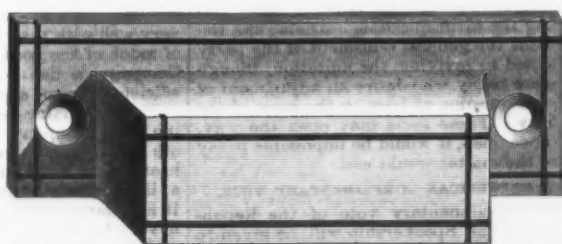
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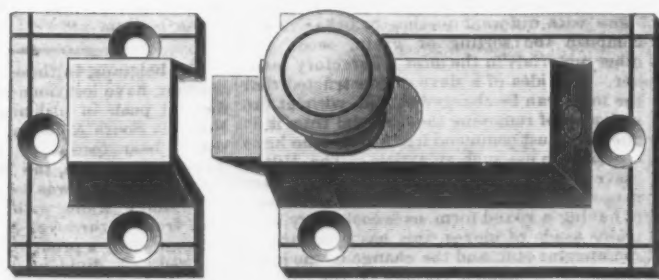
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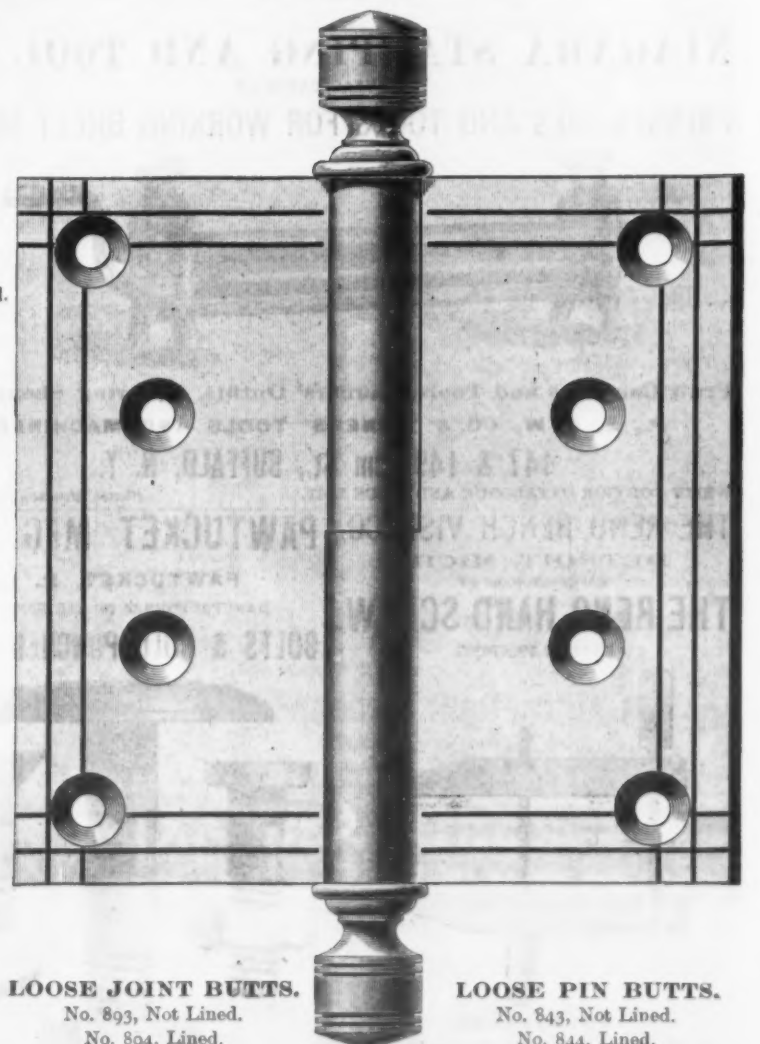
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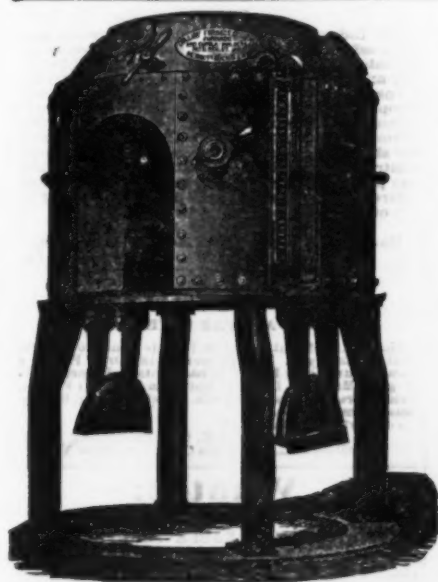
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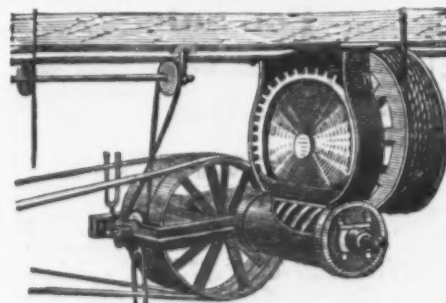
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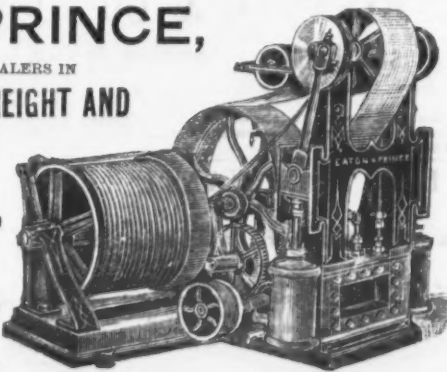
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They have a check draft and dust
damper attached to the ash-pit, to
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a trifle, then the Eastern manufacturer must equalize his freights with his Western competitor or close his works. There is no "mania" about this. It is a natural law that no skill or "combinations" can wipe out. Its effect is many times modified or hidden by an agreement of manufacturers which apportions the trade, but all this class of arrangements quickly give way when trade is stagnant.

From a thorough personal acquaintance with nearly every prominent Hardware manufacturer in the country, the writer believes that no class of trade has fought against this free delivery to the very last possible moment more energetically than that class of merchants of whom he is one.

AN EASTERN MANUFACTURER.

The following letter, which we have received from another manufacturer in a different line of goods, we are glad to lay before our readers with the sanction of the writer's signature, which will give weight to the views expressed, as those of an experienced and wise observer of the course of trade:

74 CHAMBERS STREET, NEW YORK, November 13, 1893.

To the Editor of *The Iron Age*: I carefully read "Jobber's" communication in the last *Iron Age*, and was surprised to learn of this prevailing custom of paying Western freights. Millers Falls Company for the last 20 years have been in correspondence with most of the Western Hardware jobbers, but in all that time very few of them have spoken of freights, and none of them have insisted upon their being paid by us. So far as I am aware, our's has not been a singular experience. The New York trade is still of great value, and we cannot afford to give dealers here a reasonable cause of complaint by putting it in the power of others to undersell them in their customary markets. No system of freight payments by manufacturers can be arranged on an equitable basis, owing to the varying distances and changeable rates. On many articles freight charges to the far West are more than the cost of the goods in New York.

On the other hand, manufacturers may locate in some obscure place in the East, beyond the reach of competing lines, in which event they must pay freight to some central point like New York, before their goods can take a market value, and hence began the custom under consideration. In competition with New York, it is better for Western jobbers to have their freights paid, but in competition with each other it makes no difference, provided, all are on the same footing. Whichever way the matter is finally settled, the result must be as broad as it is long for all concerned. If manufacturers pay freights, they must add the aggregate amounts to the price of goods. Of course, a crop of manufacturers will ripen each year whose needs will compel them to realize on their goods, regardless of cost or profits. Such men will pay transportation or make discounts which solvent firms cannot afford and do not need to meet, as a losing business will shortly take itself out of the way. I fear that "Jobber" will be hurt by his own boomerang, as many Western jobbers will hear of the extent of this matter for the first time from him, and imagine that they have been left. Truly yours,

H. L. PRATT,

President Millers Falls Company.

That the custom of delivering goods West on the part of manufacturers and jobbers has grown to considerable proportions is evident from the communications which we have received from numerous parties. A large and well-known manufacturing house in Western New York refer to the subject as being a very broad one, and from their standpoint speak of it as very burdensome—so much so that they would be very glad to find some practical plan for dispensing with it entirely. In the same spirit a manufacturing concern in Ohio speak of having fought for years against making deliveries at any point excepting place of manufacture. They have found it, however, impossible to stem the tide, and would be very glad to return to their former manner of doing business; but they frankly confess that they do not see any way to correct the practice and are unable at present to make any suggestion regarding it. In the same spirit, but more crisply, a manufacturing company in Pennsylvania say: "We dislike the whole business and have been forced into it by Eastern manufacturers." A manufacturer in an Eastern State writes to this effect: "We have carefully read the article in *The Iron Age* signed 'Jobber,' and with him cannot see the common sense of Eastern manufacturers who, having no Western competition, pay freight to Western points; but, where an article is made in both the East and West, it may be desirable to equalize matters by having a few prominent points for common delivery." A Western manufacturer expresses views in which most of our correspondents agree, as to the importance and difficulty of this subject. He speaks of the question as being very broad and difficult of solution, remarking bluntly that the practice and question have been cursed and discussed without much success. From the tenor of the communications that we have received and the interest which has been awakened in the matter, it is evident that this practice is recognized as a growing evil, and it is to be hoped some way may be found out of the mischief and inconvenience which it occasions.

The following letter from a widely-known house is of interest, as showing the manner in which they were led into the payment of Western freight, and the way they freed themselves from the inconvenient and burdensome practice. It would be the part of wisdom for other manufacturers to adopt the same course and deliver goods f.o.b.:

WOODSOLVER, R. L., Nov. 12, 1893.

To the Editor of *The Iron Age*: Several years ago, following the lead of others, we were led into delivering goods to some of the

leading jobbing points, which afterward were increased to other jobbing points as far as the Mississippi River. But it did not end there, as retailers in some small places would send an order for, say, five dozen Wringers, and claim delivery. We would receive orders in that way, and other parties in making settlements would take off freight, claiming that other Wringer manufacturers were quoting them the price, delivered, and the result was that our entire business was getting to be one of delivery to every point we shipped to, large and small. Later on, because of delivery to the Mississippi River, which included St. Louis and St. Paul, jobbers on the Missouri River claimed delivery there, and then parties in the intervening points between the Mississippi and Missouri rivers, also claimed delivery. Finally, early this fall an old customer of ours in Denver offered us a large order if delivered to that point, and claimed that other manufacturers were offering him their goods at the price, delivered all the way to Denver.

Owing to the extremely low price to which Wringers had gone this season, we already, for self-protection, to some of the extreme points had been obliged to charge a higher price for the goods, because of the high freight to these places, as it was a fact that, when we figured the freight to some points where a party would want five or ten dozen Wringers shipped, there would be local charges from some of the large terminal points, and the freights would be so high as to leave us no profit whatever on the goods. In the case of Denver, when that came up, we found that there would be an actual loss to us, so we declined the offer, and the party did not purchase from us. Their claim, that if goods were delivered to Omaha they should also be delivered to Denver, may be just from their standpoint, but the fact is that on Clothes Wringers, if the same prices, delivered, were charged a jobber in Denver, we would actually receive \$6 per dozen less not at our factory than from a jobber here or from a jobber in San Francisco to whom goods are sold f.o.b. here, or in the case of delivery to Omaha, \$3 per dozen less for the goods. We, therefore, on the 1st of October, decided to withdraw all delivery, and sell our goods f.o.b. at our factory only, and put every one on a par, of which purpose we advised our trade as per inclosed circular, and having made a lower price f.o.b. here than we formerly made delivered, it has given general satisfaction.

Respectfully yours,
BAILEY WRINGER MACHINE COMPANY,
GEORGE REUTER, JR., General Agent.

We observe that in their circular, Oct. 1, 1893, they advert to the matter in this form: "Special attention is called to the fact that we now deliver at factory only. We have lately been asked to deliver at points as far West as Denver, and have been obliged to decline orders from there, because deducting the freight to that point would have made an actual loss to us at the low price at which our goods are now sold, and they would have netted us less than our largest customers are paying us. We have concluded, therefore, that the only just way for our customers, and the only safe way for us, is to sell our goods f.o.b. to every one." Nearly all that we have given to-day is from the standpoint of the manufacturer. We should be glad to hear from merchants on this question.

The Nail trade has been quite active, the demand holding up with surprising strength for the season. There has been, however, a disposition to sell at lower prices, notwithstanding the fact that stocks in the East are very light, and that a full assortment of Nails cannot yet be had in any quantity. This may partly be from sympathy with the general Iron market, but it is doubtless also owing to the efforts which have recently been made by Western manufacturers to sell a portion of their product in this market. Dealers continued to quote \$2.00 for retail lots, and \$2.85 for lots of 100 kegs or over, but we hear of sales having been made at much lower prices. In view of the fact that the Western Nail Association have concluded to stop all Nail machines in the West from December 20 to February 4, it is very likely that the declining tendency will be checked, if, indeed, prices are not slightly advanced.

There is no doubt that the branch of the Iron trade which has suffered the least from the decline of prices of the last few months has been the manufacture of Nails. For this state of affairs there may be a number of reasons, but the chief one is without question the course that has been pursued by the Western Nail Association in restricting production, in which attempt they were aided greatly by the strike of 1892. At the commencement of the decline in prices early in 1890, this policy of restricting production by the stoppage of Nail factories was begun, the first stoppage being in March of that year. At irregular intervals, as the condition of the market seemed to demand, other stoppages have been ordered and carried out. This has had a twofold effect; first, in keeping the stock of Nails low; and, second, in giving buyers to understand that the manufacturers proposed to keep control of the market. The effect of these stoppages on prices has been very decided. The decline from \$5.25 per keg, the highest point reached, has been very gradual. When \$3.50 was reached, the strike came to the assistance of the mills, and for months the price remained at this figure, while the prices of other forms of Iron were dropping lower and lower each day. In the meantime, however, the capacity for production began to be largely increased by the building of new Nail machines. Some of this increase was no doubt due to the policy of stoppage, but by no means as large a part of it as is generally supposed. Apart from the increase due to the natural expansion arising from the growth of the country, many mills have added to

their capacity because of a well-grounded belief that in a close market a small Nail factory could not produce as cheaply as a large one, nor could a small number of machines keep up the assortment as well as a large number.

Another element that has led to the increase in machines, especially in old factories, has been the change from iron to steel. A small factory could not consume the product of even a 4-ton Bessemer converter, which is the size that three Steel Nail factories are building. Notwithstanding the varied influences which operated to strengthen the Nail market, the same causes that have forced down the prices of other Iron products have at last been potent in the Nail trade, and Nails are gradually falling. The increased capacity is putting more Nails on the markets of the West, and the stoppage of the machines west of the mountains is not of itself sufficient to secure the best results. The West deem it necessary that the Eastern mills should stop also. During all of these stoppages by the Western Nail Association, and during the four months' strike, the Eastern mills ran on, and have reaped whatever benefit there was in these stoppages, without having to submit to any of the accompanying disadvantages. It is understood that the West have recently asked the East to join with them in a stoppage, but did not meet with much encouragement. This seems to have had its effect upon the market, as it apparently indicated that the day of stoppages was over, and that unrestricted competition was at hand. A new phase has, however, now been put on the situation by the action of the Western Nail Association in determining to stop. As the Eastern Association have intimated that they might stop in January, but that in any event they would not send Nails west of the mountains during the Western stoppage, it now looks as though the two sections might work in accord and to mutual advantage in preventing a disastrous break in prices. We learn that Nails are much lower in price to-day than this day last month; \$2.65 is the quotation of Western jobbers, which would indicate \$2.55 in car-load lots. A month ago they were selling at \$2.70 to \$2.80. The Eastern prices would inevitably come down in sympathy with Western prices, as the only difference there can be between prices of Nails East and West is the freight, which is, say, 20 cents a keg. Whether Nails will go lower than this for the present will depend somewhat upon the action of the two Nail associations. Should they both conclude to stop production for a time, this would start the spring trade with a light stock of Nails. The present price would undoubtedly be maintained for a while, at least until the new mills building found it necessary to seek trade. To get this they must buy it, and it can hardly be supposed that old mills will allow their trade to be taken without an effort to keep it. Altogether, the outlook in the Nail trade for prices next year is not a brilliant one, unless a "boom," of which there are now no indications, sets in.

The demand for Barb Wire continues very good. Some mills are now running double turn, which is quite an advance on "overtime." The meeting of Barb Wire manufacturers, which was held last week at Chicago, appointed a committee to communicate with the manufacturers who were not represented there, with the view of effecting a combination to regulate prices. The meeting did not decide to pay 30 cents per cwt. royalty to the owners of the Barb Wire patents, but did decide to endeavor to have the royalty reduced from its present figure, which is 75 cents. Some of the manufacturers assert that they will not pay any royalty. It is announced by telegram from Joliet, Ill., that all the Barb Wire makers of that place intend shortly to remove their factories to Missouri and other points within the jurisdiction of Judge Treat, whose recent decision in St. Louis, declaring the Washburn patents invalid, protects all the manufacturers there from interference and the payment of a royalty. Prices in this section are firmly held at 7 1/4 cents per pound for ordinary lots, and 6 cents per pound for large quantities.

At this time a good deal of interest centers in the market for Agricultural Tools, as prices are made and orders booked for the coming year, and we are glad to report a healthier condition of things and better prices than a year ago. Last season, both Steel and Wood Goods were sold in the open market, every manufacturer for himself and at very low prices. While the trade was unsatisfactory to the manufacturers two important points were, however, gained. First, the experience of the year before had cured several makers of the demoralizing practice of guaranteeing prices, and most of the standard manufacturers finally had a price of their own. Second, several leading makers abandoned the former custom of selling on long time, bill's being payable in August or September, and made their terms 60 days, with 2 per cent discount for cash within 10 days. In accordance with the agreements which were made this fall, of which our readers have already been informed, Snathes and Grain Cradles, commonly termed Wood Goods, are held by the association makers at these prices: 40 and 5 per cent. discount to small trade; 40 and 10 per cent. on orders for 25 dozen Snathes or 10 dozen Cradles; 40, 10 and 5 per cent. discount on orders for 100 dozen Snathes or 25 dozen Cradles. Terms as above, 60 days, less 2 per cent. for cash in 10 days,

except on winter shipments, on which 60 days from March 1 are given. Freight is allowed to the principal jobbing cities north of the Ohio River. On Forks, Cast Steel Rakes, Weeders and Hooks, known as Steel Goods, there are combination prices of 50 per cent. discount to ordinary buyers, with an added 10 per cent. for orders for 100 dozen Forks or more. Terms similar to those we have above mentioned for Wood Goods. These prices are an advance of from 20 to 25 per cent. on former prices, but are fixed at a point fairly remunerative to the manufacturers, and satisfactory, we believe, to the buying trade in general. As far as we can learn, these prices are strictly adhered to, and we hear of no complaints of manufacturers deviating from them in the least.

The outlook for the coming year is usually regarded as very favorable. Steps for the concerted action which we have mentioned were taken early. No contracts of goods that we hear of were accepted before its adoption—except in the case of Hoes, which are outside the combination, and of which we speak below. Stocks carried over were light in the hands of most dealers and makers. It is perhaps to be said that the orders booked at the present time are not, in all cases, as large as those received by this time last year, but we learn from several makers that the trade has thus far been even better than that of the past season, and one maker mentions to us that early in October three-fourths of his whole product was already sold. There seems, however, to be a disposition on the part of buyers to withhold their orders until they see whether or not these rates are to be adhered to for the coming season, a question which will be decided within a few weeks. The general impression, however, prevails that these combination rates will be maintained. On account of the possibility of a decline of the prices at the end of this season, it seems to be the purpose of most jobbers not to buy goods to carry into another season; consequently it may be anticipated that the early orders will generally be smaller than they have heretofore been, with the exception of sorting up frequently after the spring trade sets in. It may be questioned whether the manufacturers will be able to fill promptly so many small orders as are likely then to be offered, in which case, the Union may see fit to advance prices still further. As far as we can learn, the Northwest is practically bare of both Steel and Wood goods. Change from the long time formerly given to 60 days' time ruling during the past year, combined with the fact that buyers generally have been conservative in their purchases, has made the stock which they have carried over very light. Hence, it is anticipated that the demands for small tools will be fully equal to the supply. The experience of the trade has shown that hard times, or dull times, generally curtail the sales of costly tools like Reapers, Mowers, Threshers, &c., but more, rather than less, hand-farming tools are then sold, as they are cheap and a few dollars will buy a good many of them.

Hoes and Malleable Garden Rakes, which are also classed as Steel Goods, are not controlled by association prices, and, with an overproduction, have been selling at very low figures—in many cases at a loss to the makers; 60 per cent. may be mentioned as a regular price on these goods, 60 and 10 being given to large buyers. This condition of things has not materially changed. Prices still rule very low, and a good many large orders have been booked, and some of the prominent manufacturers mention that up to the present time the demand has been nearly as large as at this time in former years. In this line, as in the case of Forks, manufacturers are very generally adopting the practice of selling at 60 days, with 2 per cent. off for cash, and not allowing bills to run to August or September, as formerly. It is not unlikely that Hoes and Malleable Iron Rakes will be sold in connection with Forks at lower prices than if Forks were not controlled by a combination; but there is something like an agreement among Hoes and Fork makers with reference to the limit of discount on Hoes to the jobbing trade. While Hoes and Malleable Iron Rakes, not being controlled by the combination, may affect the prices at which jobbers will sell Steel Goods generally, yet, so far as the combination is concerned, it is probably stronger as it is than it would be had an attempt been made to include these goods in it with important makers outside, and one heavy sale, at least, made to a very large jobber.

It is, we think, a matter of congratulation that the combination on Wood and Steel goods is so firmly adhered to. The prices which are determined upon are remunerative to the manufacturers and yet are yielding only a fair profit. It is not to the interest of merchants, manufacturers or consumers to have goods sold below a living profit.

The trade in the larger Agricultural Implements was only fair the past season, the light crops in some States limiting the sale. But few goods are, however, carried over, and the outlook is regarded as promising. It is still too early for trade in this line of goods to open, but the prospects are that prices will remain about the same as last season.

The Milwaukee Hay Tool Company, Milwaukee, Wis., have recently appointed F. Porter Thayer, 79 and 81 Reade street, New York, their Eastern agent. Among the goods they offer are Grosscup's Single Harpoon Horse Fork, the Milwaukee Re-

versible Wood Track Hay Carrier, Malleable Iron Grapple, &c. Mr. Thayer is also the representative in this market of the Chieftain Hay Rake Company, of Canton, Ohio. This well-known article is sold to the trade at \$20.

A meeting of the manufacturers of Wrought Iron Goods was held in this city on Monday. The condition of the market was discussed, and it was agreed that there should be more uniformity in the matter of prices. After due consideration it was decided that the price to the regular trade should be fixed at discount 70 and 10 and 7 1/2 per cent., cash, 30 days. This covers the line of Staples, Hooks and Staples, Hasps and Staples, Trap Door Rings, Hitching Hooks and Rings, &c. The limit below which the manufacturers are not to sell to any party gives a material advance on rates at which these goods have recently been sold. Prices had unquestionably gone below the point at which a profit is left for the makers, and it will be for the interest of the trade to maintain the prices determined on. The following houses are parties to this agreement:

SARGENT & CO.
HUMASON & BECKLEY MFG. CO.
WILLIAMS, WHITE & CO.
WHEELING HINGE CO.
STANLEY WORKS.
D. BREWER & CO.
AUER & McMAHON.
ANTON AUER.
KEISER MFG. CO.

In the present condition of the market there are, as our readers know, some lines of goods especially demoralized, the supply being in excess of the demand, and undue competition forcing prices down. Carriage and Tire Bolts belong in this class, business being at present, as it has been for some time, in a very unsatisfactory condition. The demand is reported as unusually light for this season of the year, and the number of manufacturers being large and eager for orders, they are competing for the trade that is offering. As a result, prices have been cut so far that but little, if any, profit remains to the manufacturers. The export demand has also fallen off considerably, though we hear of a few fair-sized orders received on foreign account.

In Carriage Hardware the demand has of late been below the average for this season, but a number of orders, larger or smaller, have been coming in. Prices during the past month have settled somewhat. The different manufacturers are adding to their line of goods. In the catalogue of H. D. Smith & Co., Plantsville, Conn., which has recently been issued, we note a number of articles not contained in their previous list. This catalogue, by the way, is handsomely printed in water-marked paper, and has an exceptionally full and convenient index. These manufacturers have during the past year added to their works considerably, having made an addition to their factory of two brick buildings, one 163 x 150 feet, and the other 150 x 40 feet, besides the erection of other smaller additions.

We are also in receipt of the illustrated catalogue of Malleable Iron Carriage and Wagon Hardware made by the Eberhard Manufacturing Company, Cleveland, Ohio, and also of their Catalogue A, containing special goods for the general trade, such as Clamps, Picket Pins, Kettle Ears, &c., of which they carry a full line. Their stock amounts, they inform us, to fully 600 tons of finished goods.

The attention of the trade is directed to the advertisement on another page of a new Attachable Ice Creeper, made by Nelson Lyon & Bro., Albany, N. Y. This article is meeting, we are told, with a ready sale, and is being sold by many leading jobbing houses.

On the 10th inst. the Hunter Sifter Manufacturing Company, of Cincinnati, Ohio, was organized as a corporate company with a capital stock of \$100,000, with J. M. Hunter, president and treasurer and G. W. Werner, secretary. The following persons were chosen directors: R. M. Bishop, Jr., J. B. Wilson, Geo. W. Werner, J. M. Hunter and Daniel Peters. The change was necessitated by reason of their constantly increasing business.

Last year, except in the Southwest, a good skating year, and stocks in dealers' hands were generally well depleted, making the business of the manufacturers the present season fully up to the average. The orders from the large trade have been satisfactory. Prices have not materially changed, but are a trifle lower than last year. At this time trade is light, the large orders being filled and manufacturers and jobbers waiting for the smaller orders which will follow the opening of the skating season, when stocks in retailers' hands are beginning to be broken. The advertisement of Barney & Berry, the well-known makers of Skates, will attract the attention of our readers. Their descriptive catalogue for 1893 is elegantly printed, and contains cuts and full descriptions of their goods, with the long prices. We are also in receipt of it in another form, very convenient for store use—the condensed list, with cuts and sizes, mounted on heavy cardboard, with an eyelet hole for hanging it up, the other side of the card giving a conveniently arranged cypher telegraph code. By the special notice which our readers will find in another column, it will be seen that the house of Henry Brooks & Co., 115 Milk street, Boston, are offering a large stock of Forbes' patent Acme Skates at special figures. The demand for Roller Skates is fair in spite of the fact that in some sections they have fallen into comparative disuse.

about all that is produced—i. e., an average of 700,000 tons and upward every week—which fact alone indicates the magnitude of the Coal business. Prices are pretty well maintained, generally on the basis of August circulars. Free-burning Coal alongside in New York may be quoted \$4.10; Broken and Egg, dull. Chestnut has sold for \$3.90 @ \$4.25 alongside, according to quality. About \$2.80 @ \$3 is a fair quotation for Pea. Lehigh is quoted—Lump, \$4.90 @ \$5.25; Chestnut, \$4.50. The Delaware, Lackawanna and Western Railroad Company have decided to extend their Coal business, by building enormous bunkers at South Chicago, and establishing a line of barges between that port and Buffalo, one effect of which will be to relieve the Eastern market. The Coal companies at present say nothing about a suspension in December. The Pottsville Journal says the trade in furnace sizes continues to be slack. Bituminous Coal is perhaps in a little better demand, with increased shipments from the mining regions, and in some instances prices are improved.

FOREIGN TRADE MOVEMENTS.

Included in the imports for the week ending November 9 were 1-ading articles of merchandise valued as follows:

	Pieces.	Value.
Antimony.....	34	\$1,220
Brass goods.....	53	5,531
Bronzes.....	47	8,411
Chains and anchors.....	48	1,773
Clocks.....	60	5,776
Copper.....	21	12,779
Cutlery.....	2	32,050
Gas fixtures.....	2	755
Guns.....	9	21,197
Hardware.....	7	314
Iron, hoop, tons.....	1	35
Iron, pig, tons.....	2,413	29,079
Iron, sheet, tons.....	371	43,754
Iron, other, tons.....	1,163	36,485
Lead, pigs.....	1,645	5,987
Machinery.....	124	11,667
Metal goods.....	130	19,285
Nails.....	6	59
Needles.....	12	2,824
Nickel.....	14	4,550
Old metal.....	1	115
Platinum.....	8	11,015
Plumage.....	242	11,015
Platedware.....	10	6,093
Percussion caps.....	5	1,001
Pins.....	19	1,735
Saddlery.....	1	1,500
Steel.....	2,317	29,159
Tin, bxs.....	45,578	221,369
Tin boxes.....	45,578	221,369
Tin slabs, 4222, lbs.....	150,010	105,884
Wire.....	511	9,425
Zinc oxide.....	348	3,842

The imports of hardware and metals compare with previous dates as follows:

	For the 45 weeks.	Same 1882.
Cutlery, pkgs.....	64	6,535
Hardware, pkgs.....	7	1,023
Iron, R. E., bars.....	10,759	92,934
Lead, pigs.....	1,265	12,124
Steel, pkgs.....	2,317	2,454,211
Tin, bxs.....	45,578	1,854,728
Tin slabs, 4222.....	459,010	2,556,560

PHILADELPHIA.

Office of The Iron Age, 229 South Fourth St., Philadelphia, November 13, 1883.

Pig Iron.—The indications of improvement noted in our last appear to have been confirmed, sales in 1000-ton lots having been made at an advance of about 25¢ per ton, as compared with prices 10 or 15 days ago. The upward movement is not general, however, but it is a significant fact that the advance has been on large lots, and not on 50 or 100 ton lots. The amount of business transacted has not been unusually large, but a few heavy consumers have felt it necessary to cover at least some portion of their requirements, and, as already stated, this could only be done by paying slightly higher prices. The smaller class of buyers may not be called upon to pay any advance at all, but concessions of 50¢ @ \$1 per ton, which were granted some time ago, cannot now be had even by the very best class of buyers. This condition of affairs seems to indicate that stocks are in manageable shape and not larger than required for the ordinary run of trade, in which case a gradually hardening tendency in prices will naturally follow. It is rather premature to make predictions, however, and consumers are disposed to wait developments, in the meantime taking only such lots as are required for use within the next 30 days. Sellers are also equally careful not to drive trade away by asking higher prices, and are entering orders to a moderate extent for forward delivery at current rates, and, in fact, doing all that can be done to retain their trade without sacrificing prices. Confidence in values would be much stronger if the demand for Finished Iron were better, but so long as that remains in its present dull and depressed condition, consumers are not likely to take alarm because of a slight stiffening in Pig Iron. At the same time, there is no doubt whatever that the market for raw material is in better condition than it has been for several months, and it is generally believed that prices can be maintained, although the crucial point will probably be six or eight weeks later on. Sales during the week (for tidewater deliveries) have been as follows: Gray Forge, \$18 @ \$18.50, choice brands up to \$20; No. 2 Foundry, \$19 @ \$20; and No. 1 Foundry, \$20.50 @ \$22; market quiet and steady.

Foreign Iron.—No inquiries likely to lead to business, although Bessemer is offered at \$20.50, and 20¢ Spiegel-Fein at \$30.50.

Muck Bars.—Demand rather light, with sellers of best qualities at \$33 @ \$33.50 at mill.

Blooms.—There has been rather more business doing, but prices are very irregular. Sales of small lots at about the following prices: Charcoal Blooms, \$55 @ \$57; Run-out Anthracite, \$47.50; Scrap Blooms, \$42 @ \$43; Northern Ore Blooms, \$39.50 @ \$41.50.

Bar Iron.—The market remains in the same dull and unsatisfactory condition as noticed for many weeks past. There is no doubt that consumption has fallen off to a very serious extent, and at this late season there is nothing to warrant hopes of improvement until after the holidays. Some mill-owners are talking of shutting down about the middle of next month, and, unless business improves, the suspension will probably be more protracted than usual. Not only is the demand light, but prices are most unsatisfactory—in many cases little, if anything, beyond first cost. Still, manufacturers are very unwilling to lose their trade, and, in the hope of something more favorable turning up later on, they accept the best

prices they can get, so as to keep at work a few weeks longer, by which time it is expected that the outlook will be more clearly defined. On such a market it is difficult to quote prices with precision, but the range is from 2¢ to 2.2¢, with the majority of transactions at about medium figures, according to quantity, quality and specification of sizes.

Plate and Tank Iron.—With the exception of the demand from the shipyards there is very little new business offering, and prices continue weak, with a slight downward tendency. The mills have a moderate amount of work under contract, and will probably have no difficulty in utilizing their full capacity during the balance of the year, but there is increasing anxiety in regard to the future, and for good-sized lots prices can be shaded a little. Asking prices are about as follows: Tank Iron, 2.5¢; Boat Plate, 2.35¢ @ 2.4¢; Shell, 3¢ @ 3.25¢; Flange, 4¢ @ 4.25¢, and Fire-Box, 5¢ @ 5.5¢.

Structural Iron.—There is very little change to report, the demand being only moderate at about former quotations. The recent inquiries from the shipyards have resulted in orders for something near 1000 tons of Shapes, beyond which no transactions of importance have been heard of for some days. The outlook is not specially encouraging, but prices remain as last quoted, viz.: Double-Refined Bars, 2.4¢ @ 2.5¢; Bridge Plates, 2.5¢; Angles, 2.3¢ @ 2.4¢; Tees, 2.8¢ @ 3¢; Beams and Channels, 3.5¢.

Sheet Iron.—The demand is somewhat irregular, but, on the whole, has been fairly satisfactory for Thin Sheets, while other descriptions are dull and neglected. The sale of Sheet Iron has probably been heavier than in any previous year, but production has been increased to a still greater extent, so that competition for business is as keen as ever. For small lots quotations are about as follows:

Common Sheets, No. 28.....	4 1/2¢
Common Sheets, Nos. 26 and 27.....	4 1/2¢
Common Sheets, Nos. 21 to 25.....	3 1/2¢
Common Sheets, Nos. 18 to 20.....	3 1/2¢
Best Reformed, 1/4" advance on the above.....	6 1/2¢
Best Bloom Sheets, Nos. 24 to 25.....	6 1/2¢
Best Bloom Sheets, Nos. 16 to 21.....	6 1/2¢
Common Red Plates, 3-16 to 16.....	2 1/2¢
Blue Annealed.....	2 1/2¢
Best Bloom, Galvanized, discount.....	45¢
Second quality, discount.....	50¢
Common.....	55¢

Wrought Iron Pipe.—The market continues in a fairly satisfactory condition as regards the amount of business done, and manufacturers appear to consider the position a trifle more satisfactory. Prices, however, are unchanged, and remain as last quoted, viz.: 70 and 10¢ off on Gas and Steam Pipes and 62 1/2¢ off on Boiler Tubes.

Steel Rails.—There is no special change to note, the general position being much the same as during the previous week. A moderate amount of business is being done at prices ranging from \$36 to \$37, but it is understood that several additional large lots have been sold for winter and spring delivery at about \$35, but it is impossible to get particulars. At the same time, there is no reason to doubt that sellers are willing to accept that price for winter work, and for large lots \$35 @ \$36, according to delivery, is probably a fair quotation. It is thought that further transactions based on the above quotations will be closed in course of a few days.

Old Rails.—There is a fair amount of inquiry and prices are firm. Sales have been made at \$24, Philadelphia, for Old American T's, with additional lot under negotiation at same price. Foreign T's for shipment are offered at \$23.50, with buyers at \$23.25. Market steady.

Scrap Iron.—Choice No. 1 commands \$24.50 @ \$25; medium, about \$23.50 @ \$24, and cargo lots \$22.50 @ \$23; Machinery Scrap, \$16 @ \$17, according to quality.

Nails.—Although there is still a good business doing, the market at the moment appears to be somewhat quieter, and there is less difficulty in securing Nails than has been the case for some time past. We quote \$2.85 @ \$2.90 per keg, with still lower figures in exceptional cases.

Mr. Jones Wister, formerly manager of the Wister Furnace, at Harrisburg, Pa., has been admitted to an interest in the firm of L. & R. Wister & Co., of Philadelphia.

PITTSBURGH.

Office of The Iron Age, 17 Fourth Avenue, Pittsburgh, Pa., Nov. 13, 1883.

While it is admitted on all hands that the general Iron trade is far from being satisfactory, its condition is not so bad as some of the papers here and elsewhere would make it. In Pittsburgh, at least, the volume of business continues large, as is evident from the fact that the mills are nearly all in operation, some working up to their full capacity, and large shipments are being made daily by river and rail. Advice from Chicago, Milwaukee, St. Louis and other large points of distribution West and South are of a similar character; competition is active, and the anxiety to secure business is so great that prices are cut to such an extent that the margin for profit is exceedingly small.

Pig Iron.—There has been but little change in the condition of the market during the past week; business is all that can be expected under existing circumstances, and prices remain unchanged. Consumers, almost without exception, are adhering closely to the hand-to-mouth policy, buying only as immediate wants require, and the indications are that they will stick pretty closely to this course until the close of the year. Producers still refuse to make any concessions, claiming that rather than do so they will blow out, on the ground that it is better to do nothing than to work for nothing or at a loss. There is considerable iron being sold every week, nearly all in small lots, and our home furnaces have all they can do. We repeat former quotations:

No. 1 Foundry.....	\$21.00 @ \$22.00, 4 mos
No. 2 ".....	19.00 @ 20.00, 4 "
Neutral Gray Forge.....	17.00 @ 18.00, 4 "
Mottled and White.....	15.00 @ 16.50, 4 "
Silvery Iron.....	15.00 @ 15.50, 4 "
All-Ore Mill.....	13.00 @ 14.00, 4 "
Warm-blast Charcoal.....	21.00 @ 22.00, 4 "
Cold.....	20.00 @ 21.00, 4 "
Bessemer Iron.....	20.50 @ 21.00, 4 "

Muck Bar.—There has been no change in the situation since our last; business continues exceedingly dull, with but little prospect of any immediate improvement. Prices

are still quoted at \$32 @ \$32.50, cash, but few sellers as yet at inside quotations.

Manufactured Iron.—There has been nothing new developed during the past week; the mills are all in operation, some working single, others double, and manufacturers report no change in prices, which are very unsatisfactory. Orders are mostly small, which indicates an apprehension of lower prices on the part of buyers, who are keeping themselves in position to take advantage of the same in the event of a decline. We continue to quote prices on a basis of 1.8¢ to 1.9¢ for Bars—that is, for assorted orders, 60 days—with the usual discount of 2¢ for cash.

Nails.—The demand is falling off and prices continue weak; sales have been made as low as \$2.55, and even \$2.50 for car lots, 60 days, 2¢ off for cash, and 5¢ @ 10¢ per keg additional for small lots. The regular monthly meeting of the Western Nail Association takes place to-morrow, but the indications are that the matter of production will not be taken up—that each firm will be at liberty to run or stop, as they please.

Wrought Iron Pipe.—Orders have commenced to fall off, but the Pipe mills are still in operation working up old contracts. The mills here have had about all they could do since last spring, but prices have been cut so close that there has been little or no margin for profit. Discounts remain unchanged at 73 @ 75¢ on Gas and Steam Pipe, and 60¢ on Boiler Tubes.

Steel.—This important interest remains unchanged in regard to demand and prices, both of which are unsatisfactory. Standard brands Refined Cast Steel, 1 1/2¢ @ 12¢ per lb; do. Crucible Machinery, 6 1/2¢ @ 7¢; Open-hearth and Bessemer do., 4 1/2¢ @ 5¢; Steel Boiler-plate, 6¢ @ 6 1/2¢. Nearly all steams on Western and Southern rivers are now supplied with Steel Boilers.

Old Rails.—Some few small sales of American T's have been made during the past week at \$23.50, but they were not first class; we are reliably informed that standard brands cannot be laid down here under \$24.50, and the last sale reported was at \$24.50. The demand, however, is light, and some of our largest consumers are pretty well supplied.

Steel Rails.—This important interest continues in an unsettled and unsatisfactory condition, and intimations are thrown out that it may be necessary before long to reduce production, in view of the lack of orders, and then at the prices the margin for profit is light. However, some of the mills are pretty well sold for next year, and there is a probability that there will be an increased demand in January, if not before. Prices for delivery this month or next may be quoted at \$36.50 @ \$37, cash, at mill.

Railway Track Supplies.—Business continues slow; prices weak, but nominally unchanged: Railway Spikes, 2.6¢, 30 days; Splice Bars, 1.9¢ @ 2¢; Track Bolts, 3¢ @ 3 1/2¢, with square and hexagon nuts.

Crop Ends.—American are still quoted at \$23.50; the last sale of Foreign reported was at \$25.15, delivered in Pittsburgh.

Scrap.—Wrought Scrap remains unchanged at \$21 @ \$22.50 per net ton. Sales Selected Railway Scrap at \$22.50; Old Car Axles, \$30 @ \$32; Wrought Turnings, \$16 @ \$18; Old Car Wheels, \$19 @ \$19.50, gross; Cast Borings, \$13 @ \$14.

Window Glass.—The strike continues, but it is intimated that the strikers are disposed to have a conference. It is not likely that the factories will be started up before January, if then. Our manufacturers are still putting out considerable Eastern glass; but, as might be expected, they are having a good deal of trouble in filling their orders, for want of an assortment.

Coke.—The general situation remains unchanged; business is all that can be expected, in view of the depressed condition of the Iron trade. Blast-furnace Coke remains unchanged at \$1 per ton, free on cars at ovens.

(Special Dispatch to The Iron Age.)

PITTSBURGH, PA., November 14, 1883.

The meeting of the Western Nail Association in this city to-day was very largely attended, all sections of the West being represented. After careful consideration of the situation it was unanimously agreed to stop all Nail machines in the West on December 22, the stoppage to continue until February 4. These dates were fixed as they cover the close of the fall trade and the beginning of the opening of the spring trade. This indicates a determination on the part of the Western Nail Association to control their prices and product. The Rolling Mill and Nail Factory of the Norton Iron Works, at Ashland, Ky., burned down last night. This mill has 94 Nail machines and 20 single puddling furnaces.

CHICAGO.

Office of The Iron Age, 38 and 38 Clark St., Chicago, Nov. 12, 1883.

Hardware.—The season being somewhat advanced, it is not to be expected that trade should be as active as a month ago; consequently, jobbers report a "little falling off" in the demand during the past week, though a fairly good trade is doing. Some lines of goods are keeping up remarkably well—such as Door Locks, Sash Locks, Bolts, Butts, Screws, &c., in Builders' Hardware. There is also quite a brisk demand for some articles in Heavy Hardware, such as Shovels, Hammers, Chains, Spikes, Horse Nails and Blacksmiths' Tools, together with Stove Goods and Hollow-ware. Up to this time there is not much complaint about the volume of goods sold, jobbers claiming that the bulk of shipments for the season equals that of other years, if not more. Prices, they claim, continue unchanged and unremunerative on many of the different articles of merchandise handled by Hardware dealers.

Nails.—The condition of the Nail market is much the same as it was last week. There is no diminution in the demand, which, during the past week, is said to have come principally from direct consumption. Consumers are buying with more than ordinary caution, none believing that Nails, at even the present low figures, have reached bottom. We quote \$2.75, 2¢, 60 days, for carload lots, and \$2.80 for less quantities in a retail way from stores. Stocks continue light.

American Pig Iron.—The Pig Iron market presents a brighter outlook. While the market cannot be considered brisk, or even buoyant, there is an average business doing, and more than one would expect after reviewing the general conditions of the Iron interest. The fact is pretty generally conceded that Pig Iron has touched the lowest figures that it will reach in this market, and consumers are casting about preparatory to placing orders for their winter supply of Charcoal Iron. We hear of consumers of Coke and Anthracite Irons offering to buy their supply for 1884 at 50¢ per ton less than our quotations of to-day without success, while another has attempted to buy Southern Iron, for delivery from February to June in 1884, at present cash prices with the same result. Furnacemen decline to accept present prices for anything but immediate delivery, though they are weaker now than at any previous time during this season. On many of the grades of iron there has been a decline of from 50¢ to \$1 per ton during the week, which seems to be the result of the unsettled condition of the general trade, rather than the lack of activity, as there has been more Iron sold during the first 10 days of this month than the two weeks previous.

We quote as follows for carload lots, 4 mos.: Lake Superior Charcoal, Nos. 1 and 2, \$22.50 @ \$23; No. 3 at \$23.50; No. 4 at \$25, and Nos. 5 and 6 at \$24; Lake Superior Coke at \$21 @ \$22; Lake Superior and Ohio, mixed, at \$21; Ohio Standard Black Band, No. 1, \$23 @ \$24; Southern, No. 1, at \$21, and No. 2 at \$20; Silvery Soft at \$19.50 @ \$22; Anthracite, No. 1, at \$22, and No. 2 at \$21. For 100-ton lots, immediate Chicago delivery, the following cash prices are quoted by furnace sales agents:

Briar Hill.....	\$22.00
Iron River.....	21.50
Himrod, No. 1.....	21.50
Rockwood, No. 2.....	19.50
Sloss Silvery, open.....	19.50
Briar Hill Scotch.....	23.50
Deer Lake Iron, Nos. 1 and 2.....	22.50
Fond du Lac.....	22.00

Scotch Pig.—The market for Scotch Pig is steady, but quiet. There is very little of any kind of foreign Iron used, and what is in hand is held firm, at the following quotations for cash: Coltness, \$29; Summerlee, \$28, and Glegarnock, \$28.

Merchant Steel.—There is not much to be said about this market. There is some business doing on small orders—principally retail—but things are of a "blue Monday" appearance throughout the trade. The inferior brands, as they are termed, find preference with many of the consumers because they can be had for less money, and among jobbers of these grades cutting for competing trade is the order, which usually results disastrously to the profits of the jobber. This state of things keeps the market for No. 1 Steel very quiet, as the manufacturers are determined not to meet the prices at which the inferior grades are sold. We continue our former quotations for the best grades of established Steel as follows: Refined Cast Steel, 10 1/2¢ @ 11 1/2¢ per lb; Crucible Machinery, 6 1/2¢ @ 7¢; Bessemer and Open-hearth do., 4 1/2¢ @ 5¢; Steel Boiler Plate, 6¢ @ 6 1/2¢.

Steel Rails.—The Steel Rail market continues very quiet. The recent decline at Eastern mills has not developed any demand, and the mills are running on the small orders that spring up from day to day. The Chicago Rolling Mill, a branch of the North Chicago Rolling Mill at South Chicago, closed on the 3d inst., for want of orders, but they continue to have enough to keep the other one running for the present. They quote \$37 @ \$38 to meet the decline in the East, but have not had any inquiries at the latter price, as railroads claim that a reduction of freight rates will be necessary if Rails are furnished at prices now prevailing, and are therefore inclined to delay rather than hurry their orders.

Old Rails.—The scarcity of Old Rails is being felt somewhat, and the market continues firm at \$21 @ \$22. All that is offered are fairly taken, while there is more inquiry than usual at this time.

Bar Iron.—There is a fair demand for Best Refined Iron, both from store and for shipment. Some of the dealers report more sales in a day than can be made by their mills in the same length of time, while others are complaining that business is quiet. Orders are not large, but come often and for good assortments. Best Refined, "new puddled," is quoted at \$2 @ \$2.10 for the general run of orders; desirable lots can be had at the customary concessions. Beyond this the market is regarded as firm and more encouraging than was generally anticipated several weeks ago.

Builders' Iron.—The demand for this class of Iron has received a hard knock from the present cold snap, which makes outdoor work quite unpleasant and in part suspended. We continue our former quotations, though the market is quiet and on the decline: Tank, 2.7¢; Angles, 2.9¢; Beams, 3.6¢, and Channels, 3.6¢ @ 3.8¢.

Galvanized Iron.—There is a fair demand for Galvanized Iron, and the better grades are firmly sustained at 45 and 5¢ off for Juniata, and 45 and 10¢ off for Refined, with some concessions for special lots. Among the lower grades of Galvanized Iron there is much cutting, which has a disastrous effect upon the market. Manufacturers of established brands are unwilling to meet the price of much of the Iron that is being put upon the market.

Black Sheets.—Black Sheets are in fair request in the lighter numbers, while there has been some improvement for the heavier grades. Prices in a retail way are fairly well sustained, but for large quantities considerable cutting is in vogue among manufacturers as well as dealers. We quote No. 24 at \$3.50, Nos. 25 and 26 at \$3.65, and No. 27 at \$3.80.

Scrap Iron.—The supply of Scrap is considerably more than the immediate requirements. Furnaces are not buying very liberally, but continue to quote \$18.50 @ \$19, Chicago or Milwaukee delivery, for No. 1 Mill Scrap. The following prices are quoted as dealers' purchasing prices: No. 1 Wrought Scrap, per net ton, \$17; Cast Scrap, per ton, \$15; No. 1 Stove Plate Scrap, per ton, \$9; Wrought Turnings, per ton, \$9; Cast Iron Borings, \$6; Old Plows and Plow Steel, \$10; Malleable Scrap, \$5.

EVERETT & POST, 156 Lake Street, Chicago, report to us as follows, under date of November 10, 1883: **Pig Iron.**—Since our last report the Lead market has shown considerable weakness. Prices have declined from \$3.80 to \$3.70, under sales of some 700 tons Common and Refined. The consumption still continues large, and most of the refiners are sold ahead; consequently, stocks in the West are not accumulating. Still, there is enough Lead coming in to supply current requirements of consumers, and, unless some manipulation takes place, we do not look for any improvement until after the turn of the year.

CHATTANOOGA.

Office of The Iron Age, Market and 8th Sts., Chattanooga, Nov. 12, 1883.

The weather during the week has been summerlike in its mildness, and closes with steady, though light, rain, which is needed to swell the streams. General trade continues in a healthy condition. The cotton crop is being pushed to market more rapidly than ever before, a result of our greatly improved railroad facilities. New Orleans has received many thousand bales this year in excess of her receipts to same date last year, and the same is true of all cotton-buying points. It looks now as if the entire crop would be in second hands by Christmas. There will be more cotton than any of the estimates calculated, the "top crop" having been greatly enlarged by the favorable weather last month and this. Merchants throughout the section are sailing close, doing a safe business.

Pig Iron.—The market has been more or less affected in the better grades by the late cuts at Northern trade centers, but makers stubbornly refuse to concede any lower prices than we quote on small bills, and shade about \$1 per ton for large lots. They will blow out before going down. We quote the same as last week, and note a rather duller trade. We quote No. 1 Foundry, \$19 @ \$20; No. 2 Foundry, \$18 @ \$19; Gray Forge, \$16 @ \$19; White and Mottled, \$14 @ \$15; Car-wheel Metal, \$24 @ \$26.

Ors.—We quote 50¢ Brown Hematite, per ton, \$2 @ \$2.75; Red Fossil, \$2 @ \$2.25, delivered at furnace.

Miscellaneous Articles.—Old Rails are steady at \$21 @ \$22, with small stocks. Scraps, except No. 1 Wrought, are about off the market. Wrought Scrap, \$18 @ \$22; Cast Scrap, \$11 @ \$14; Old Wheels, nominal, \$22.

Nails.—We quote them fairly steady at \$2.70, 60 days, 2¢ off for cash; job lots 10¢ @ 15¢ higher.

Merchant Iron.—Bar is dull at \$2 for assorted bills; Bolts, \$3 @ \$3.20; Spikes, \$2.50; Splices, \$2.

Coal.—We quote Fancy Lump, \$3; Common, \$2.50; run of mine to manufacturers, \$1.50 at mills.

Coke.—We quote Furnace Coke, \$3 at point of consumption; Foundry, 10¢ @ 12¢ per bushel.

LOUISVILLE.

Geo. H. HULL & Co., Commission Merchants, report to us as follows, under date of Nov. 10, 1883: The market for Pig Iron is quiet and the sales for Hot Blast Iron continue good. Many of our foundries are full of work and consequently consuming a great deal of Iron. There is still a tendency on the part of buyers to wait each lot of Iron lower than the last purchase, but furnaces are sold so far ahead that they are declining to reduce prices, and the outlook is a little more favorable. As the stock of Iron in the country is being reduced about 20,000 tons per month, and prices are as low as they ever were, we see no reason why Iron should go lower:

FOUNDRY IRON.		
No. 1 Hanging Rock Charcoal.....	\$23.00 @ \$24.00	
No. 1 Southern Charcoal.....	21.00 @ 22.00	
No. 1 Hanging Rock Stonecoal and Coke.....	19.50 @ 20.50	
No. 1 Southern Stonecoal and Coke.....	17.00 @ 18.00	
No. 2 Southern Stonecoal and Coke.....	15.50 @ 16.50	
"American Scotch".....	17.00 @ 18.50	
Open Silver Gray.....	17.50 @ 18.00	
Close Silver Gray.....	16.50 @ 17.00	

MILL IRONS.		
No. 1 Charcoal.....	19.00 @ 20.00	
No. 1 Stonecoal and Coke, Neutral.....	17.00 @ 17.50	
No. 2 ".....	15.50 @ 16.00	
No. 1 ".....	15.50 @ 16.00	
No. 2 ".....	15.00 @ 15.50	
White and Mottled, Cold-short and Neutral.....	15.00 @ 15.50	

CAR WHEEL IRONS.		
Hanging Rock, Cold-blast	23.00 @	24.00
Warm-blast	23.00 @	24.00
Alabama and Georgia, Warm and Cold-blast	27.00 @	28.00

Star Hack Saw Price List.

PRICE OF BLADES.

Length of Blade	6 inch	7 inch	8 inch	9 inch
Price per Dozen Blades	55c.	60c.	65c.	70c.

PRICE OF STEEL FRAMES PER DOZEN.

No. 1. Extension Frame, Polished and Nickel Plated, per Dozen	\$9.60
" 2. Solid " " " "	8.40
" 3. " " " " Rough Nickeled	7.20

These frames are all made of steel, and, as seen in the cut, are all adjustable so as to face the blade in four different directions. The extension frames will hold the four different lengths of blades. The solid frames only hold the 8-inch blades, this being the length most in use. They all have the patent staple-shaped pins to hold the blades in the frame, which are so arranged that they cannot fall out.

As this Saw cuts almost everything, it will do most of the sawing required about a house, shop or farm. It is especially good for Retail Hardware Dealers to cut Chains and Bars of Iron and Steel. One blade, which costs 5 cents, will cut off half-inch round iron 30 times, and the same size untempered steel 40 times. These blades are all fully warranted, and may be returned at our cost if they do not prove better than any other kind in market. All genuine goods are marked with a star (*) and bear our name.

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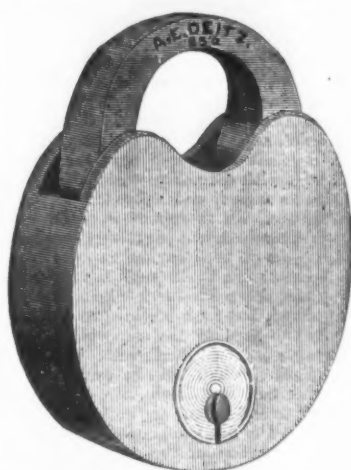
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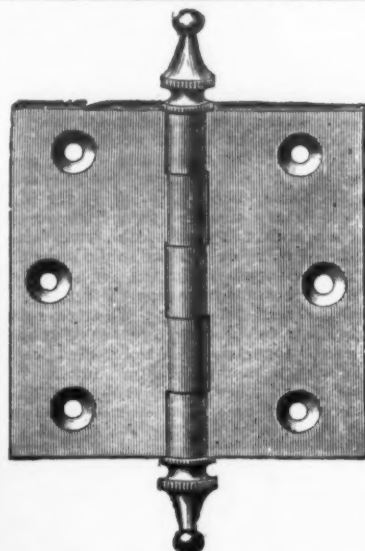
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Worcester, Mass.
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97 Chambers and 81 Reade Sts.
NEW YORK.
DURRIE & McCARTY,
Sole Agents.

1883.
PENNSYLVANIA
LAWN MOWER.

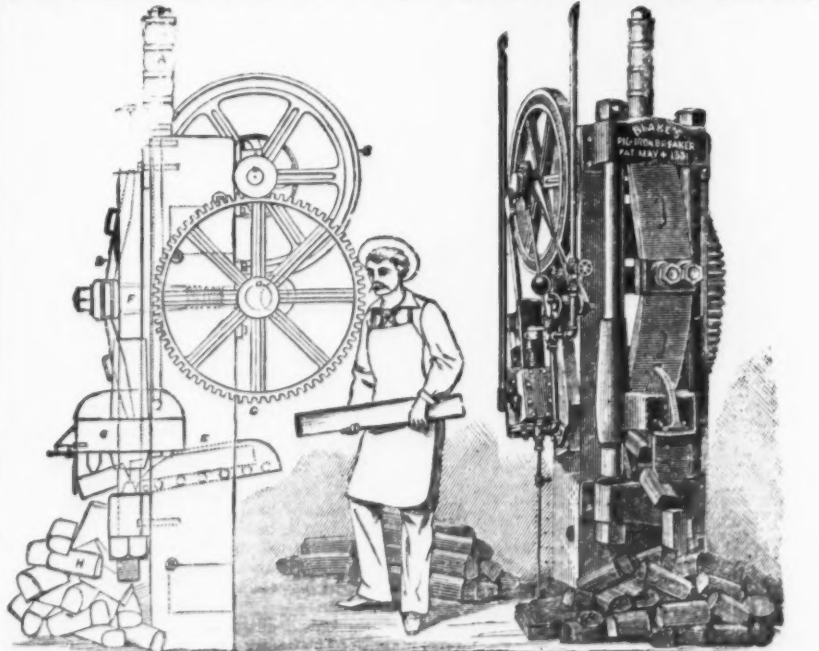
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A new and successful machine for breaking pig iron into any length desired, with rapidity and economy. Besides saving in cost of breaking by hand, it secures the greatest economy in melting. Several machines already in use. Every machine guaranteed against breakage of parts. Requires but three horse-power. Can be run by belt or have small engine attached.
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IN LARGE VARIETY, &c.
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their manufacture are also large makers of Wire, such as the Cleveland Rolling Mill and Cambria, leads to the belief that they will turn their energies to Wire, and we can see no advance with a large product forced on the market. The volume of trade is large and collections fair. The clearings of Louisville show a handsome increase over last year. The net earnings of the Louisville and Nashville Railroad for the last three months are about \$600,000 greater than for the corresponding period last year.

CINCINNATI.

NOVEMBER 12, 1883.—*Pig Iron*.—All the features of the market remain substantially as last reported. The supply is practically unchanged, consumers buying to meet the present demand and at former prices. The demand is reported mostly for very soft and Silvery Hanging Rock kinds, for mix to reduce the shrinkage and hardness of the kinds from other districts. Quotations are as follows:

Hanging Rock Hot-Blast Charcoal Foundry	\$23.00 @ 24.00
Southern Hot-Blast Charcoal Foundry	20.00 @ 21.00
Southern Hot-Blast Coke Foundry	18.50 @ 20.00
Hanging Rock Hot-Blast Coke Foundry	19.50 @ 21.00
" American Scotch	20.50 @ 21.00
" S. G. Softers, No. 1	20.00 @ 20.50
" No. 2	19.50 @ 20.00
" No. 3	18.50 @ 19.00
Old Blast Charcoal Car Wheel	27.00 @ 28.00
Warm Blast	25.00 @ 26.00
Force Charcoal	22.00 @ 23.00
Coke	17.00 @ 18.00
Stonewall	16.50 @ 17.50

No sales Scrap reported.

NOTICE.

Office of E. L. HARPER & Co.,
CINCINNATI, Nov. 7, 1883.

We take pleasure in announcing that we have been appointed sole agents for the Quinnimont Furnace, West Virginia. This iron, as is well known by the many familiar with its merits, is in the fore-front of the Neutral Coke Irons, and is popular, not alone for its superior qualities in strength and softness, but because of its uniformity of grading. It is pre-eminently a reliable Foundry Iron. We have a limited amount of Nos. 1 and 2 Foundry on hand. Soliciting your esteemed inquiries for prices, yours very truly,
E. L. HARPER & Co.

ST. LOUIS.

HOFFER & Co., Pig Iron and Iron Ore Merchants, 214 Pine street, report to us as follows, under date of Nov. 10, 1883: We have to report a quiet Pig Iron market, with prices unchanged. We quote:

HOT-BLAST CHARCOAL IRONS.	
Missouri	\$19.50 @ 20.50
Southern	20.00 @ 22.00
Ohio	24.00 @ 26.00
COAL AND COKE IRONS.	
Missouri	19.50 @ 20.50
Southern	18.50 @ 19.50
Ohio	21.00 @ 25.00
MILL IRONS.	
Red-short	18.50 @ 19.50
Neutral	17.00 @ 18.00
CAR WHEEL AND MALLEABLE IRONS.	
Missouri	19.50 @ 21.00
Southern	23.00 @ 25.00
Ohio	28.00 @ 32.00

BALTIMORE.

W. N. WYETH, Iron and Steel Merchant, 46 and 48 South Charles street, reports us the following, under date of Nov. 12, 1883: Trade for the past week ruled much the same as last reported. Values are depressed and undersold at annexed figures:

Ref. Bar Iron, 1 to 6 x 3/4 to 1 1/2	\$21.00 @ 22.10
" 1 to 4 1/2 x 1 1/2 to 1 1/2	21.00 @ 22.10
" 1/2 to 2, round	21.00 @ 22.10
and Square	21.00 @ 22.10
Hoop Iron, 1 1/2 wide and upward	21.00 @ 22.10
Band Iron, from 1 1/2 to 6 in. wide	21.00 @ 22.10
Horse-shoe Iron	21.00 @ 22.10
Norway Nail Rods	21.00 @ 22.10
Black Diamond Cast Steel	21.00 @ 22.10
Machinery Steel	21.00 @ 22.10
Spring Steel	21.00 @ 22.10
Common Horse Nails	21.00 @ 22.10
Railroad Spikes, 3/4 x 9 in.	21.00 @ 22.10
Perkins' Horse Shoes, 1/2 keg of 100	\$4.37 1/2
" Mule Shoes	5.37 1/2

RICHMOND.

ASA SNYDER, Iron Merchant and Furnace Agent, writes as follows, under date of November 12, 1883: Current prices for last week are the basis for present sales. The Iron market is dull, and it is believed that some of our largest furnaces will blow out until consumption takes up with the supply now on hand. Prices as follows:

No. 1 Scotch Pig Iron	\$23.00 @ 25.00
No. 1 Anthracite Pig Iron	22.00 @ 23.50
No. 2	20.00 @ 22.00
No. 3	19.00 @ 21.00
No. 1 Virginia Coke Pig Iron	20.00 @ 21.00
No. 2	18.00 @ 19.50
No. 1	16.50 @ 18.50
Virginia C. B. Charcoal	32.00 @ 35.00
Old Rails	24.00 @ 25.00
Wrought Scrap No. 1	30.00 @ 31.00
Cast Scrap No. 1	18.00 @ 20.00
Richmond Refined Bar Iron, 1/2	2.10 @ 2.20
Horse Shoes (Tredegar), 1/2 keg	5.00 @ 5.50
Mule	5.00 @ 5.50

Our English Letter.

Review of the British Iron, Steel, Metal and Hardware Trades.

(From Our Regular Correspondent)

LONDON, ENG., Oct. 29, 1883.

THE INACTIVITY

noted in several of my recent contributions to your pages is in most instances unrelieved, while in a few other cases the preparation of season goods appears to have had a tendency to impart a slight lull to the branches concerned. Taking matters as a whole, however, I am disposed to believe that the quietude is general, with here and there an accentuation of lethargy, but with a heavy aggregate amount of business actually in course of being executed. Competition in most departments is very keen, and the number of firms is ever on the increase, while the substitution of machinery for hand labor has enormously enlarged the production. Consequently, there is not only a larger quantity of any given article on sale, but there are more vendors, so that it is not at all surprising that values should be kept down and the rivalry of producers intensified. This is especially true of

almost all kinds of hardware and knick-knacks, in which the home manufacturers have to meet the French, Belgian and German houses on ground which is predisposed in favor of the Continental articles whenever fine art is in question. It is very singular that the French, with all their undoubted skill and taste in the manufacture of bronzes, clocks and certain other goods, do not progress in the same proportion as do the Germans or Belgians. It may be that the French are neither colonizers nor developers of export trade—indeed, facts and figures serve to support the latter contention. The French do a considerable export business, I am very well aware, but I am not the less well aware that, instead of sending drummers around advertising and otherwise pushing business, the majority of French manufacturers are content to let orders find them as best they may. That being so, one need not wonder that the French art-bronze manufacturers complain that they are forestalled and undersold by the Germans in various neutral markets, including the leading cities of the United States. The fact is, I believe, that the Germans are taking the lead in some branches of art manufactures wherein Paris was once supreme—a circumstance which serves to add fuel to the absurd and petty feelings against the Germans now so pronounced in Paris. In commerce and trade the French are by far the most conservative people in Europe; hence, it goes without saying that so long as they cling to their old-fashioned ways they will never be serious competitors in the neutral or other markets for export trade. At the same time I should state that the French Government is endeavoring to stir up the manufacturers by issuing a series of more or less valuable reports from the French consuls in different parts of the world. In doing this the French are imitating the lead of Great Britain, the United States, Belgium and Germany. Each of these governments is now issuing ponderous volumes of reports from pretty nearly every known place under the sun, so that if the world be not fully exploited in the course of the next few years it will not be for want of consular literature. Yet I think one may safely say that very much of this information is of scarcely any service to practical men of business. On the whole, I think your own consular corps is the most serviceably handled of all—in relation to commerce, at all events.

THE IRON MARKET

has been quiet, and in some branches dull, since the issue of my last report—indeed, the trade, as a whole, must be presumed to be in a comparatively lifeless condition. In the open markets the amount of business current is very limited, while selling prices are depressed by the persistent efforts of the "bears," in whose favor is the general tendency of the time being. There is still a very considerable production at the various furnaces and works, and our export trade is fairly maintained by means of low selling values; yet it seems beyond question that a further period of depression is immediately before us, unless some now entirely unsuspected revival should at once set in. On the whole, it would appear to be a fact that the production of certain grades of pig iron is still in excess of the consumptive requirements of the market, and it is suspected that the same remark is now, or will shortly be, applicable to several of the manufactured-iron branches. That being so, and other points being taken into consideration, it is not easy to share the views of those who look out for an advance in prices, unless as a contingency arising out of the coal miners' agitation for higher wages. That agitation is gradually assuming a more tangible shape, and has at length proceeded so far that the men, it is understood, will give one month's notice for the extra 15%, either to-day or on Monday next. The colliery owners of the whole of the Midlands met during last week, and resolutely confirmed their previous decision not to grant any advance. This decision was not shaken by the arguments of the men's representatives at a joint interview held at Sheffield—indeed, the employers declared their utter inability to make the concession. As an instance of the unprofitable nature of the coal trade lately, Mr. George Wilson, chairman of Charles Cammel & Co., Limited stated that the Oaks collieries, owned by his company, had not yielded a profit of more than 2% for some time past. Other proprietors could no doubt, give a similarly unfavorable account of their recent operations. Should the threatened strike actually take place, however, a vast amount of harm may be done to the iron trade of this country. At Glasgow the warrant market has been very dull and weak, on the sales of large holders and the continued predominance of "bear" operators. Prices have been down to 45/1 during the week and closed at 44/11 1/2. Scotch makers' brands of pig iron have also declined by 6d. to 1/1 1/2 ton, notwithstanding the better return of shipments last week, and the fact that there are no fewer furnaces working than at the same date last year. The reserve stocks are very large, and there is a suspicion that some of the makers have heavy quantities in their iron yards; consequently, values are weak all round, and there is little or no disposition to speculate.

At Middlesboro' matters are again without animation, and quotations are irregularly depressed on the basis of 38/6 @ 38/9 for No. 3 pig. Shipments are on a moderate scale only, but stocks are said to be decreasing, in the official stores, at all events, so that the local consumption must be heavy or the make smaller. Prospects are poor, nevertheless, and there seems to be no likelihood of any early change for the better. The same remark applies with equal force to the hematite pig-iron market, in which there is no life whatever. Mixed lots are quoted at 48/ @ 48/6 in usual proportions, and large lots could doubtless be had even at less money. For next year's deliveries fair contracts have been entered into, but there is no backbone in the trade, and there will soon be no alternative but a further limitation of the output. Elsewhere all classes of crude iron are very quiet, and sales on 'change are on a limited scale. Heavy manufactured iron is very much as of late, a large current output being discounted by the absence of new orders, especially for shipbuilding sorts. The Sheffield armor-plate mills are very busy,

and have orders on hand sufficient to provide full work for a very long time ahead. For boiler plates there is a steady call, and the producers of chain and cable iron are satisfactorily engaged. Fencing wire is only in moderate request, notwithstanding the recent reduction in prices, but I hear of two or three respectable orders having been booked for South America, &c., as well as for wire netting on Australian account. Galvanized iron is quiet, so far as new orders are concerned. Swedish hammered bars are £11. 5/ @ £11. 10/, with special quotations for large quantities to arrive, and railroads £8. 5/ @ £8. 15/ 1/2 ton. In merchant iron the week has been featureless, comparatively speaking, although some of the market reports speak of an improvement. If such a movement really exists, the trade, as a whole, is to be congratulated, but I am inclined to doubt its reality in the face of the reports of those most competent to deal with the subject. Prices remain as before, with a fairly brisk call for sheets, but no activity worthy of mention in any other kind of rolled iron. The announcement of the probable reorganization of the tube trade has created a good deal of interest, and has brought in a number of Continental, &c., inquiries. Concurrently, however, I have seen various "cutting" quotations which ranged up to 7 1/2 or even 10% below the association's prices. In iron rails there is no new business. Of old rails further sales are reported on Italian account, but business is restricted by light stocks in dealers' hands and by the firmness of the railway companies who have these materials on hand. D. H. are nominally 65/ @ 67/ f.o.b. London. In heavy wrought scrap very little is being done, and prices are nominal at 55/ f.o.b. London. Freighters are about the same, namely, 5/ @ 6/ for pig iron by ordinary steamers from Glasgow to New York, and 10/ for rails, &c., from Bristol Channel ports or Barrow to the same or equal destination. Liverpool rates are a trifle firmer in some instances. Steel is dull and without material change. The Bessemer concerns are fairly busy and the Siemens works well engaged. Bessemer steel wire (Nettlefolds) is now 12/9 per cwt. for 0 to 6, 13/3 for 7, and other gauges *pro rata*. The same brand of best crucible steel wire is 5d. 1/2 for 0 to 6, 5 1/4 d. for 7, and so on. Old railway leaf-spring steel is easier at 73/6, c.i.f. New York, but nominal. There is a good demand for double screw D. H. and B. H. crop ends, 16 to 40 inches long, for present to forward delivery, and supplies are scarce. Remelting crops are not inquired about. Steel rails are very dull at about late rates (£4. 15/ @ £5 1/2 ton, ordinary flange sections of 50 pounds and upward), with scarcely any new business in the market. The production of these articles is not unlikely to undergo severe contraction before long. It is a rather significant circumstance that an order for 9000 tons of rails for Italy has been taken by a German works at a very low price, namely, equal to £4. 18/ 1/2 ton, delivered.

SCOTCH FIG IRON

is extremely flat, with a very small turnover in warrants, a fall in values below the lowest point of recent years, and no inclination to speculate on a scale likely to affect the course of the market. Warrants stood at a trifle over 45/ all last week, and finished up at 44/11, whereas a year ago the price was 50/9, with a large production, more furnaces going, and heavier reserve stocks than now. Makers' brands are all easier, despite good shipments, of which 2000 odd tons went to the United States last week. There are now 105 furnaces (of which eight on hematites) at work in Scotland, against 113 this date last year. In Connal's stores the quantity of pig iron is 589,098 tons (a decrease of 240 tons last week), as compared with 619,480 tons last year same date. To date Scotch shipments have been 533,864 tons, or 8063 tons beyond last year to same date, while importations of Middlesboro' pig iron into Scotland have increased by 26,568 tons on a total of 218,160 tons this year. Writing from Glasgow on October 26, James Watson & Co. said: "The Scotch iron market has again receded in price, owing to an absence of confidence in the future and the demand being quiet. Quotations for makers' iron are lower, in sympathy with warrants. The warrant market here opened flat on Monday, the price dropping from 45/5 to 45/1 1/2, cash. On Tuesday the price rallied from 45/1 1/2 to 45/5 1/2 ton. On Wednesday the market was weak, the price relapsing from 45/5 to 45/2, cash. Yesterday being observed as a holiday there was no market, but to-day the market was flat, with business from 45/1 1/2 to 44/11 1/2, closing with sellers at the latter figure. The shipments last week were 16,440 tons, as compared with 13,058 tons for the corresponding week of last year. We quote:

	No. 1.	No. 2.
G. M. B., at Glasgow	47/	45/
Clyde	49/	47/
Coltness	57/	51/6
Lanark	57/	51/6
Garthrie	54/6	51/
Sumnerlee	55/	50/
Calder	56/6	48/6
Carnbroe	54/	48/
Glenarnock, at Ardrossan	54/	47/
Eglinton	47/6	44/6
Dalmellington	48/	47/
Shotts, at Leith	57/	53/6
Kinnell, at Bonness	48/	46/6
Carroll, at Grangemouth	48/6	47/6

MIDDLESBORO' PIG IRON

remains exceedingly dull in the open market, and has receded in value during the week. There appears to be no confidence as to the future of the district now that the shipbuilding yards are known to be growing slack; hence No. 3 pig, while nominally held at 38/6 @ 39/ by makers, is really being sold at 35/9 for prompt, and 38/ @ 38/3 for 3 to 6 months' lots. These are about the lowest rates known for many years in this branch. G. M. B., f.o.b. at makers' wharves in the Tees (less 2 1/2%), for cash, are quoted:

No. 1 Foundry	42/6	Mottled	36/6
" 2	40/6	White	35/
" 3	38/6	Refined Metal	35/
" 4	37/6	Kentledge	40/
" 4 Forge	37/	Cinder	34/

Lower wages are talked of all round. Bolckow-Vaughans are likely to stop a rail mill unless the men meet their views on the wages question.

IN HEMATITE PIGS

there is again no change to report, either as regards prices or the amount of business

transacted. A few sales for next year's home deliveries are spoken about, but prices are kept private, which leads other persons to infer that excessively low figures have been accepted. Open quotations for mixed parcels in usual proportions stand at 48/ @ 48/6, and makers' brands of West Coast pigs are:

	No. 1.	No. 2.	No. 3.
Cleator	51/	49/6	49/
Lonsdale	49/6	49/	48/
Workington	49/6	49/	48/
Lowther	49/6	49/	48/
Distington	49/6	49/	48/
Harrington	50/	49/6	48/6
Solway	49/6	49/	48/
Maryport	49/6	49/	48/

Last week's shipments included 3461 tons hematite pig iron and 3573 tons steel rails.

TIN PLATES

are almost unchanged on the week, the slight diminution in the flow of orders being attributable to the firmness of makers, and not owing to any decrease in the demand. As a matter of fact, the call for wasters is still very lively, coke tins of this grade being freely sold at 15/6 for 14 x 10 and 14 x 20. As much as 15/9 is said to have been paid. A few second-hand lots of I. C. cokes have been sold at 16/ @ 16/6, but makers ask 16/6 @ 17/, and will not book orders at less than 16/6. In charcoal rather more is being done at 18/ @ 20/ for I. C., and 18/6 for half-cross specifications. For best coke tins 17/ @ 17/6 I. C. are quotations. Ternes are quiet (makers being steadily engaged) at 16/ @ 17/ for I. C., and 33/ @ 34/ for the large sizes. On the whole this trade is amazingly steady and seems likely to reach a brisk winter prosperity.

FOREIGN.

FRANCE.

(Moniteur des Interets Matériels.)

PARIS, October 29, 1883.—*Metals*.—Business continues picking up by degrees, with a better demand for metals and an advance in Copper and Lead. We quote at the close, in francs, 50 kg.: Copper, 160.00; Zinc, 160.00; Ingot and Sheet, 167.50; Bessemer, 171.50; and pure Corcoro Ore, 167.50. Tin, Banca, 254.00; Billiton and English, 250.00; Straits and Australian, 252.00. Lead, 30.50 @ 31.50, and Spelter, 40 @ 40.50. Iron.—There has been quite an improvement in this city, raising the price of Merchant to 18 francs. We quote Charcoal Iron, 21; Sheets, 23 @ 25, and Wire Nails, No. 15, in bulk, 27. At the North Merchant and Flooring sell at 17, Corners at 18.50 and Sheets at 20.50 @ 24. A most favorable change has occurred there all of a sudden. Some makers, before it took place, had sold to arrive at low prices all the way into 1883. In the Haute-Marne the situation is also quite satisfactory. Coke Merchant bringing 18.50. Large contracts for delivery next year have been made by the blast furnace of the Mourthe and Moselle in Pudding Pig during the week, to the value of some 10,000 tons, all told. Two-thirds of their 1884 output is now disposed of beforehand, all engaged by the rolling mills there. The price is supposed to be 18 francs, and the tendency is, if anything, upward for minor lots. Quite a demand is noticeable for rolling-mill products, but the foundries in the Basin complain of a lack of orders. No. 3 Pudding Pig is selling there at 7 francs. At St. Etienne, large demands have dropped in to furnish the three leading railroads with material. The South is about the only dull region in France just now in the iron and metal trades. At Marseilles both Copper and Tin are quite weak. Coal.—The greatest activity prevails in this city in particular, both for industrial and domestic.

BELGIUM.

(Moniteur Industriel.)

BRUSSELS, October 30, 1883.—*Iron*.—Blast furnaces turning out Pudding Pig are quite busy, whereas those making Foundry Pig have to shade their figures if they want to secure fresh orders. As for the rolling mills, they have a rather improved call for smaller articles in their line, whereas, on the whole, they are not busy enough to warrant any better prices than the current ones. With respect to Structural Iron works, it may be stated that the majority of them might be more heavily engaged than they are, but this lack of activity is due to the season. We quote English Pig, in francs, 50 kg.: 57.00; Charrier do., 57.00; Luxembourg, 58.00 @ 59.00. Pudding is firm at Charleroi at 55.00 @ 56.00, as to quality; Athus-Halanzy is steady at 4.90 @ 5.00. No. 1 Merchant is firm at 12.50; No. 2 less so at 13.50, and No. 3 at 14.50. Beams are tolerably well sustained at 15, and Corners at 13.50; Sheets may be quoted 17 for No. 2, and 16 for No. 3; Commercial, 23; Thin, 25, and No. 4, 27. From Liege we are reported to the following effect: "While the iron situation is the reverse of brilliant, Spelter, on the contrary, is looking up. Coal.—Although the coal-mining companies complain that the demand for coal for coke, as well as for small coal, is not up to expectations, it cannot be denied that the general coal movement in Belgium so far this year is quite satisfactory, and that during the past fortnight the Government railroads are conveying coal in excess of what they did last year.

GERMANY.

(Colonne Gazette.)

DUSSELDORF, Nov. 1, 1883.—*Iron*.—The resumption of adjudications on behalf of Government railroad lines begins to spread some animation in the market in Rhineland-Westphalia. Meanwhile Boiler Iron is less active. We quote in this city: Spiegel, 63; White Pig, prime, 55; Luxembourg, 40; Charcoal, 76 @ 82; Foundry Nos. 3 to 1, 59 @ 72; Spanish, 79; English No. 3, 61; ditto Bessemer at place of shipment, 42; Spanish at Rotterdam, 55.50; German Bessemer, 57.50; Merchant, 130 @ 150, and Sheets, 170 @ 190. From Breslau we receive the ensuing intelligence with reference to the Upper Silesian Iron market: "There is a confident tone and increasing firmness in this district. The acquisition of the Thomas-Gilchrist process has been a great thing for both the Konigsbutter and the Laurahütte; both very busy, with large railroad material orders in prospect. Merchant Iron is firm at 13.50; Pudding Pig steady at 5.80; week's production, 152,500 cwts. Sheets wanted at 18 @ 20.50 marks, all 50 kg. Coal active and freight scarce, as usual. Spelter firm; Silesian Union at 294 marks 1/2 ton; weekly production, 30,000 tons. Zinc Dust quiet at 15.75 marks, with cash here. Cadmium firm, Prime 90% s, in rods, 9.75 @ 10 marks 50 kg. here."

AUSTRIA.

(Austrian Trade Journal.)

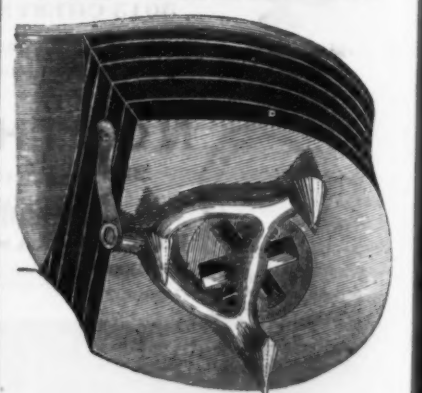
VIENNA, Oct. 28, 1883.—*Iron*.—The demand for both Pig and Finished remains as lively as ever, causing prices to show a remarkable degree of firmness. The demand for Pig is in excess of the supply; for near delivery good brands cannot be had, and even distant futures cannot be easily secured. Should this demand continue a little longer, German and English Pig will have to be imported on a larger scale. Thus the entire product of the Schwechat blast furnaces in 1884 has been sold beforehand. But we repeat that all this refers to good brands only; inferior ones are abundant, now and prospectively. Merchant Iron sells steadily in large amounts, and so do Sheets, Beams and all Steel manufactures. We quote, on a firm market, Pig, 51 @ 60 florins 1/2 ton; Merchant, 115 @ 131; Sheets, 175 @ 185, and Beams, 140 @ 145. Metals have been irregular; Copper weaker; Tin tolerably steady; Spelter quiet; Lead neglected, and Antimony and Quicksilver untraded.

The Cornwall Ore Sales Agency.—In our issue of last week we stated that the sales agency of the Cornwall ores had been given to Ethelbert Watts, of Philadelphia. This was true as regards that market, but Pancoast & Rogers, No. 18 Platt street, New York, were also appointed agents conjointly with Mr. Watts.

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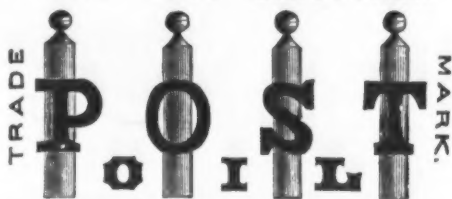


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Prof. Chemistry and Toxicology in Bellevue Hospital Medical College.

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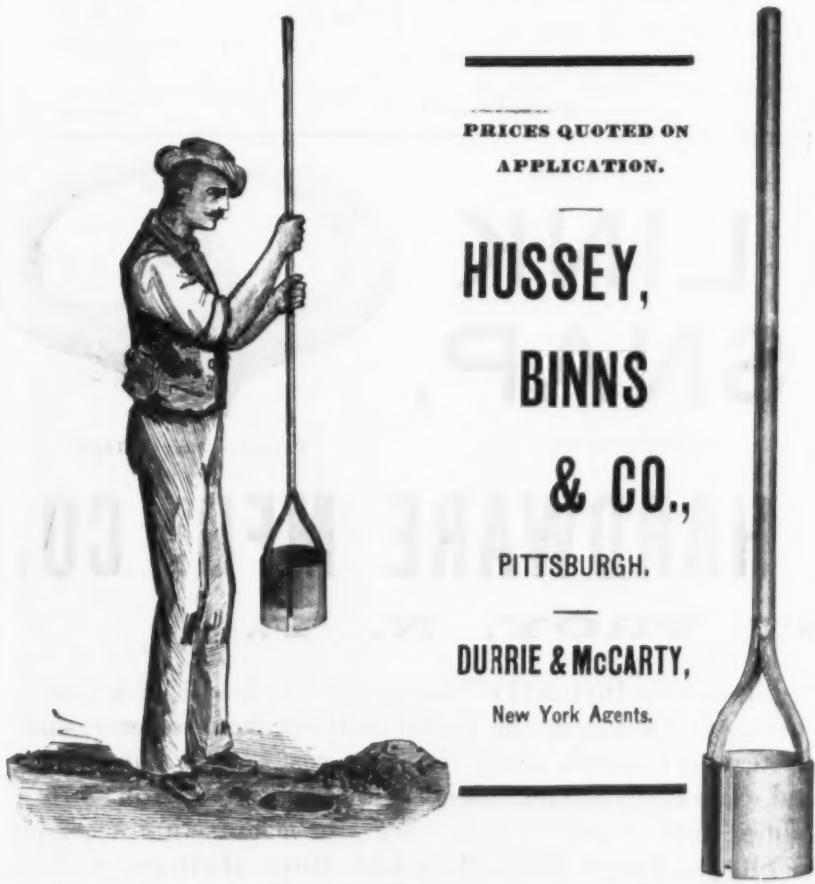
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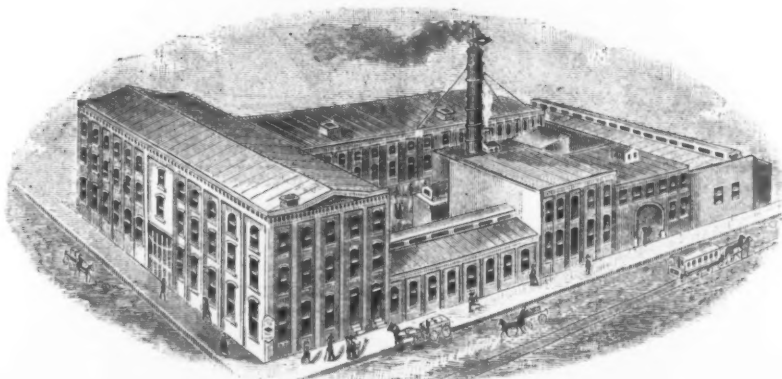
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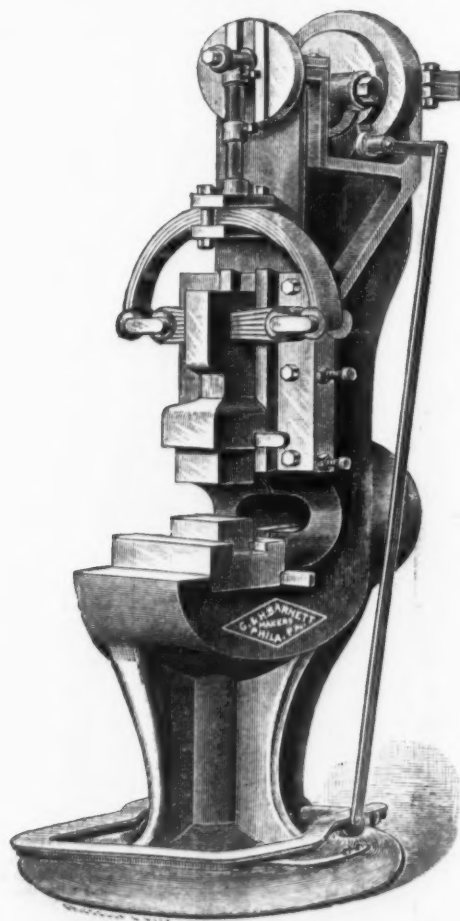
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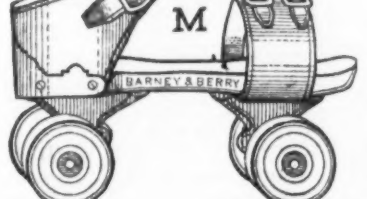
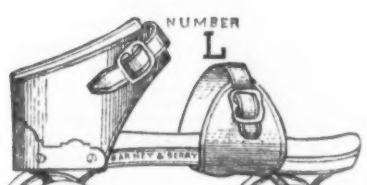
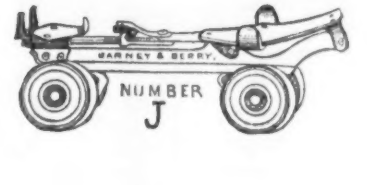
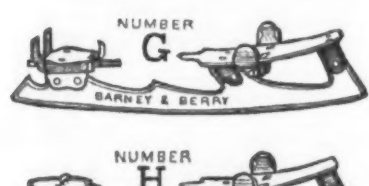
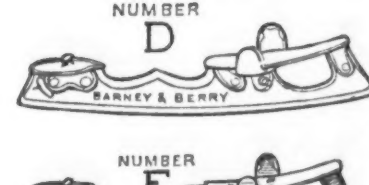
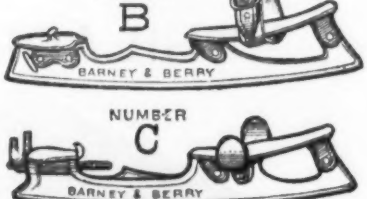
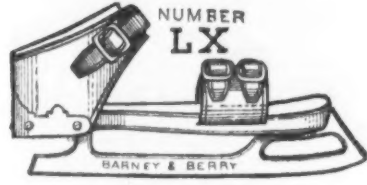
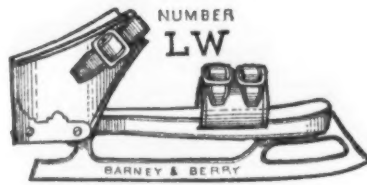
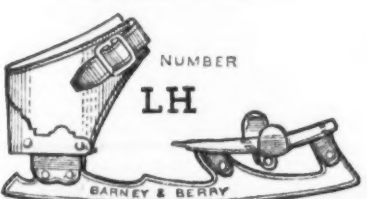
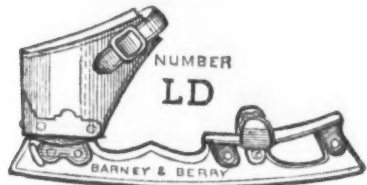
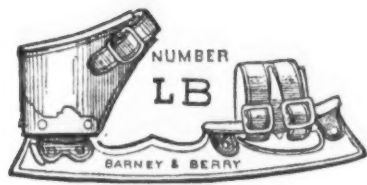
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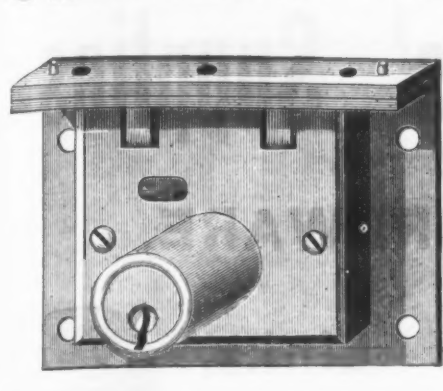
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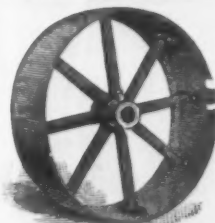
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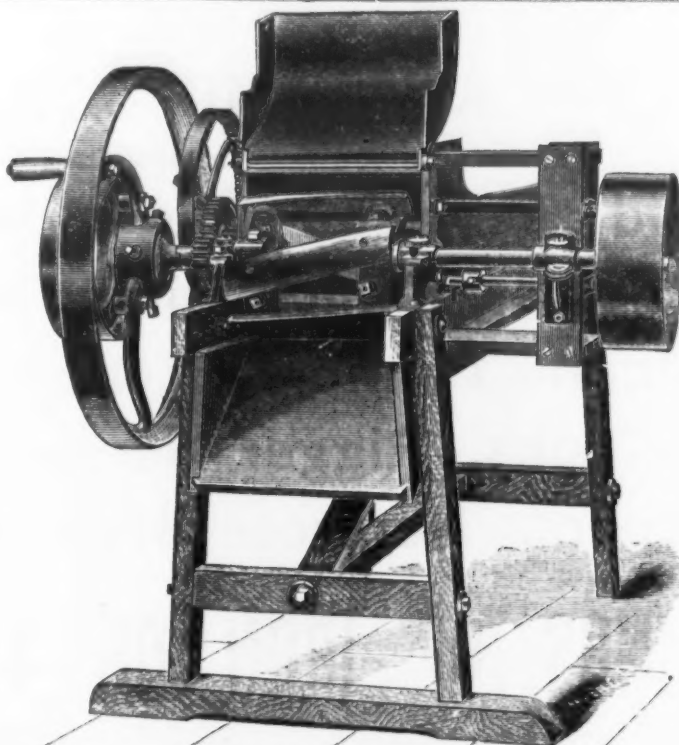
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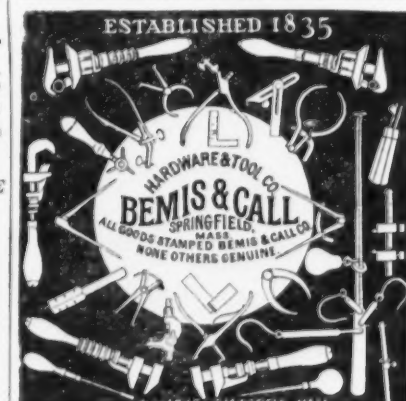
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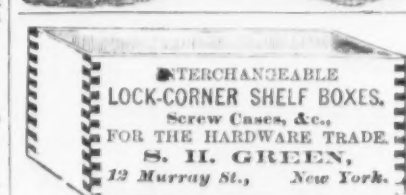
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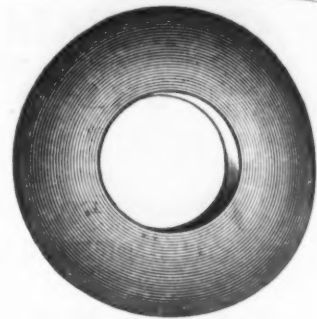
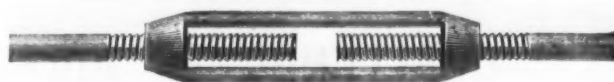
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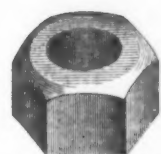
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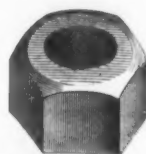
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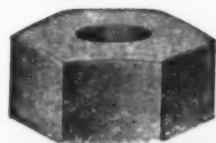
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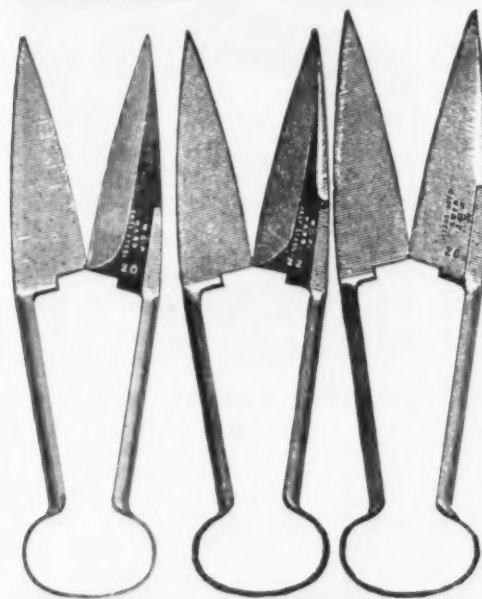
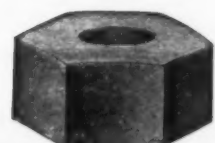
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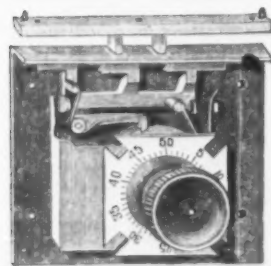
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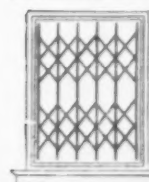
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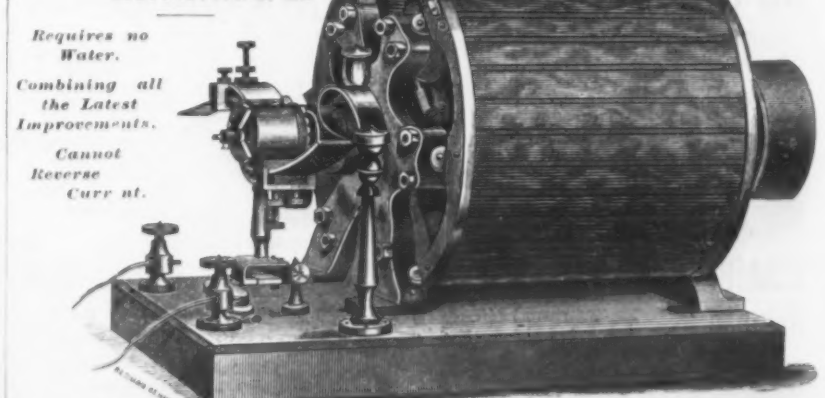
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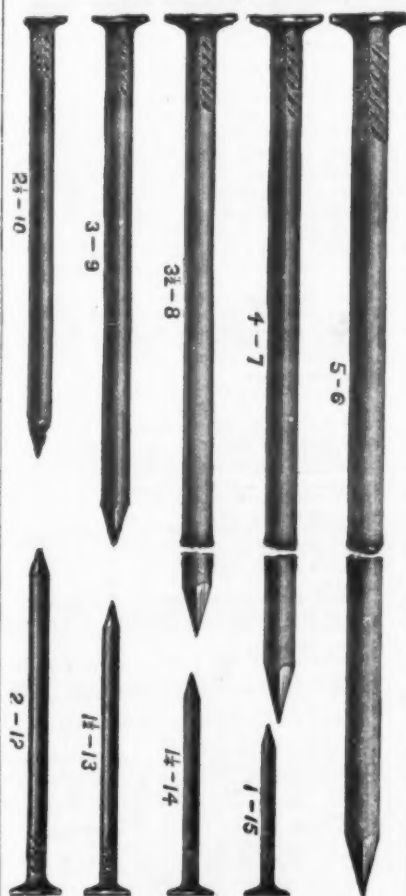
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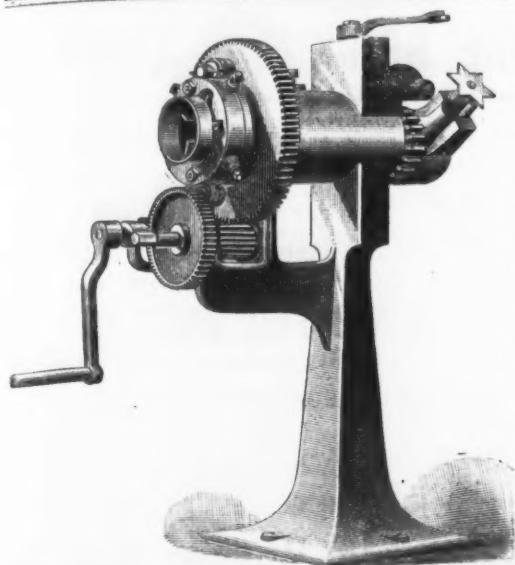
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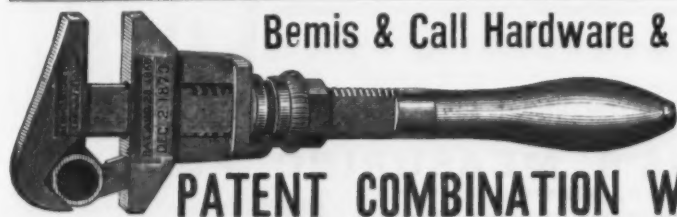
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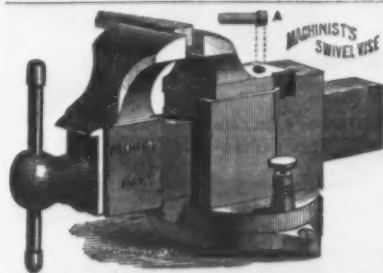
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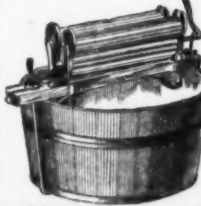
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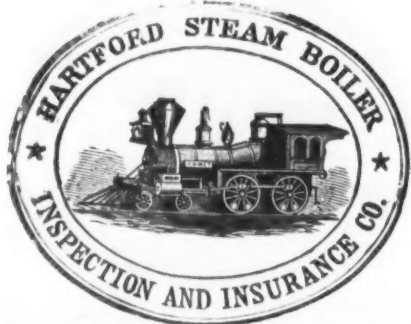
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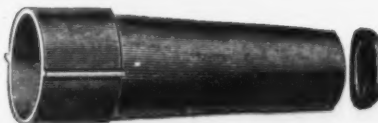
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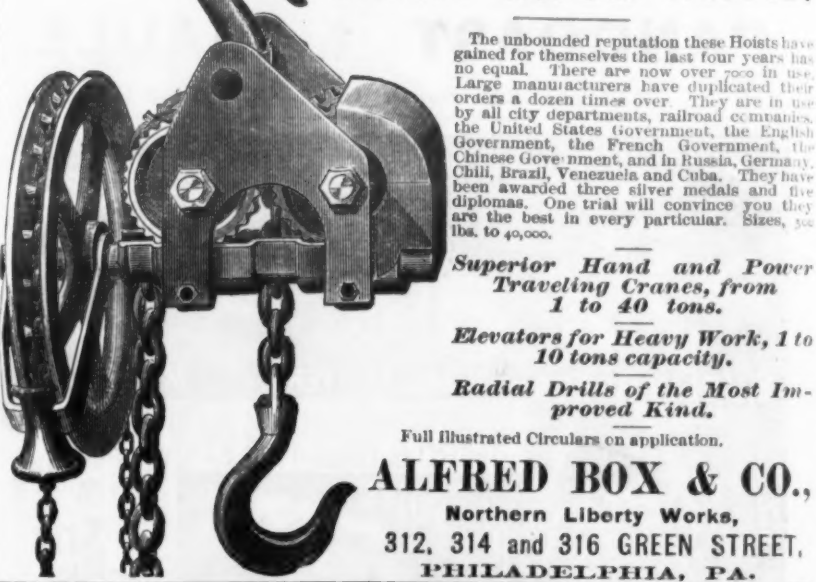
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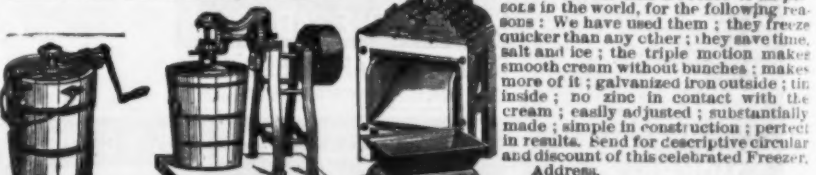
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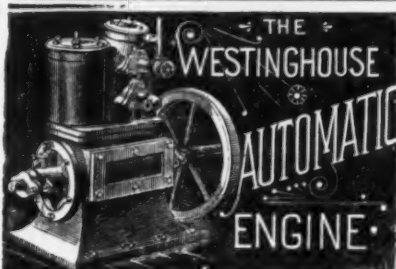
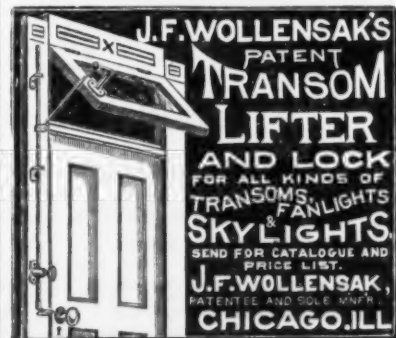
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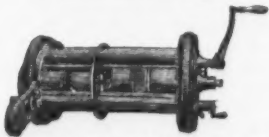
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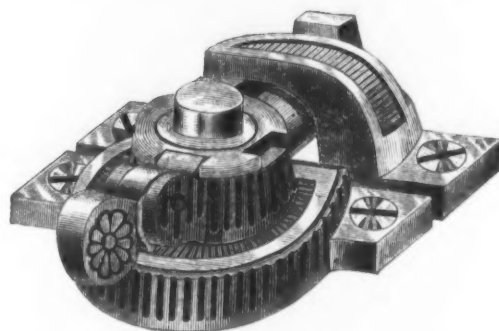
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TO THE TRADE.

GRAVITY SASH LOCKS.



Claim of Patent issued Sept. 4, 1883.

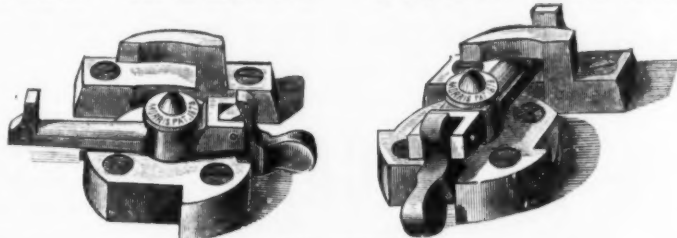
The improvement in Fasteners for the meeting rails of Window Sashes herein described, consist-
ing of the base-plate provided with a rigid post, the sweep "C" journaled thereon and provided at its
inner end with a pivoted latch, having a forwardly-extending arm which engages with a rigid notched
or shouldered flange or plate, at the top of the post above the sweep, to lock the latter as described.
Having lately secured of the United States Patent Office the above claim, and as it does not in the
least infringe the rights of the Morris Sash Lock Manufacturing Co., we shall hold the said parties
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extent against all claims of infringement by said Morris Sash Lock Manufacturing Co.
Try our Gravity Sash Locks, as they are the best in the world.

THE KEMPSHALL MFG. CO.,

September 17, 1883.

New Britain, Conn.

THE MORRIS SASH LOCK,



MANUFACTURED BY

THE MORRIS SASH LOCK MFG. COMPANY,

MANUFACTURERS OF

SPECIALTIES BUILDERS' HARDWARE,

Cincinnati, Ohio.

SPECIAL NOTICE TO THE HARDWARE TRADE.

When we published our Circular to the Trade in August last, in reference to the Kemp-
shall Gravity Sash Lock, no patent had been issued to the Kempshall Company. But to
our surprise the Patent Office last month granted them a patent, under which they are
claiming the right to make their Fasteners.

The application for this patent was made by one William E. Sparks, and we ask the

Trade to note that the Patent Office, in acting upon it, wrote an official letter, on the 18th

of last July, rejecting it on one Mr. Morris' patent of 1879, and saying:

"Morris, 22,487, Feb. 18, 1879, shows a Sash Lock which in every

"respect is equivalent to that shown and described in this (Sparks)"

"application. It is considered a matter of no consequence that the

"latch engages with the notch in the bottom plate instead of a top plate,

"and it is held to be immaterial whether the locking notches are above

"or below the latch."

As the Patent Office in July thought the Kempshall Fastener the equivalent "in every

respect," as they say, of the Morris Fastener, it will not be wondered at that we were

surprised they should in September grant a patent for it.

We have determined to test the right of this Sparks-Kempshall patent to continue in

existence, and we have therefore this week brought another suit against the Kempshall

Company, under Section 4918 of the United States Revised Statutes, to have the patent

declared void by the court, as being for substantially the same thing as our Mr. Morris'

prior patent.

The Trade therefore will please take notice, and are respectfully requested to await

the result of the litigation before being influenced by the Kempshall patent.

Cincinnati, November 1, 1883.

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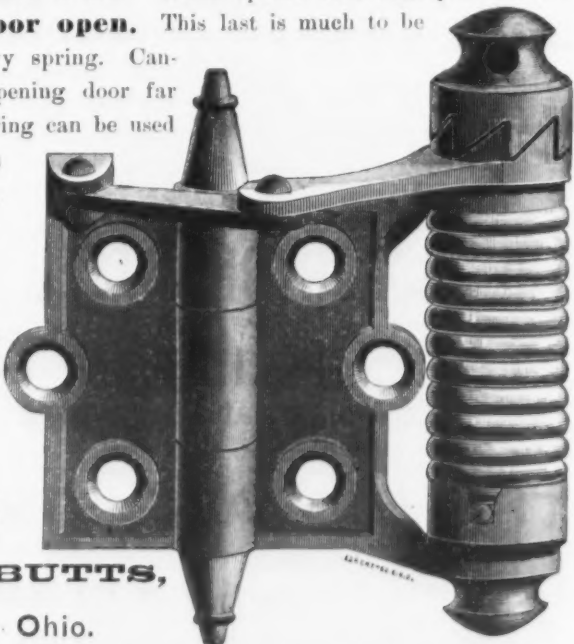
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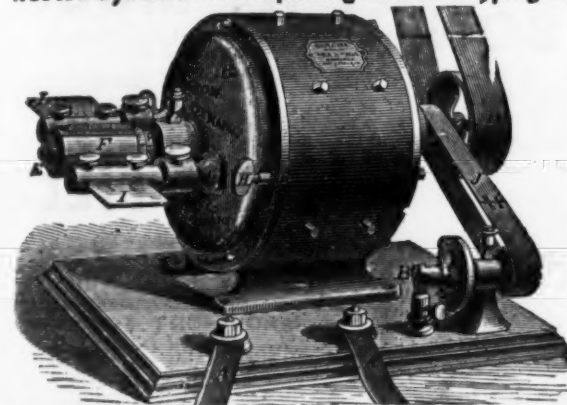
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of all forms of Automatic

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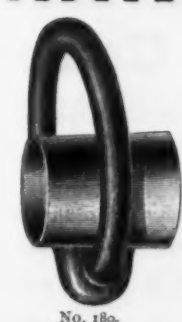
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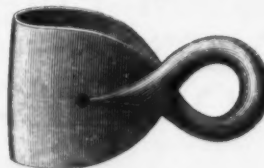
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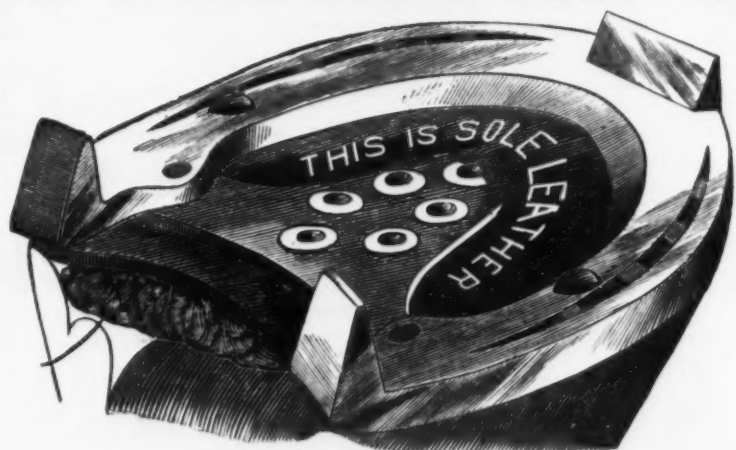
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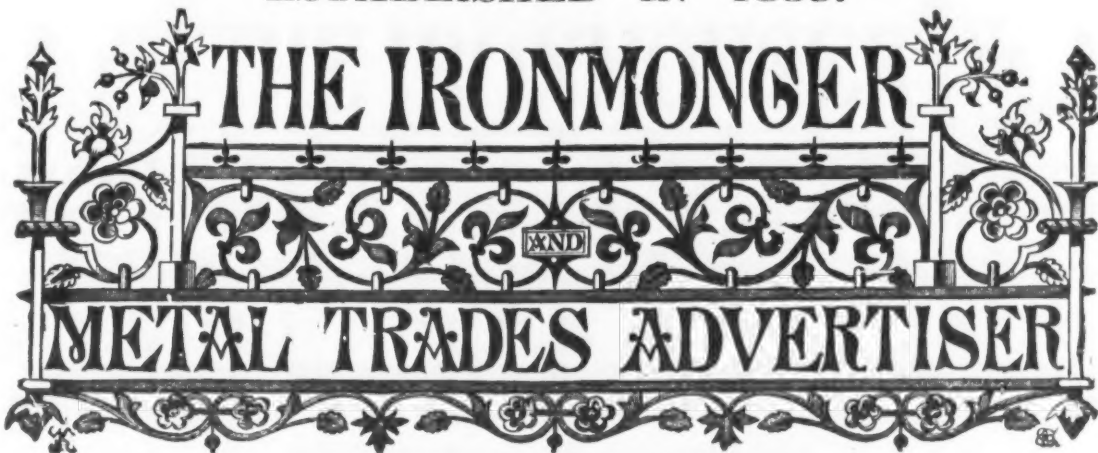
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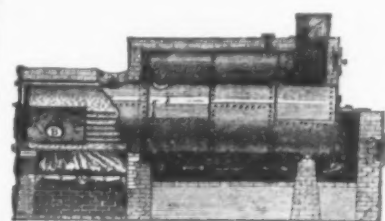
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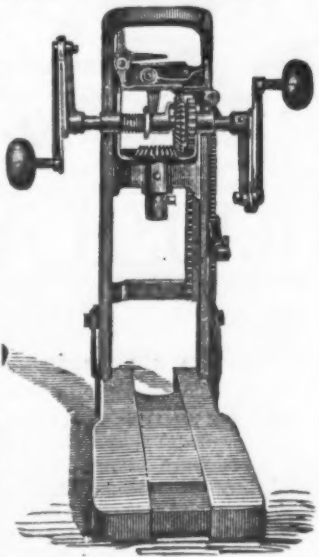
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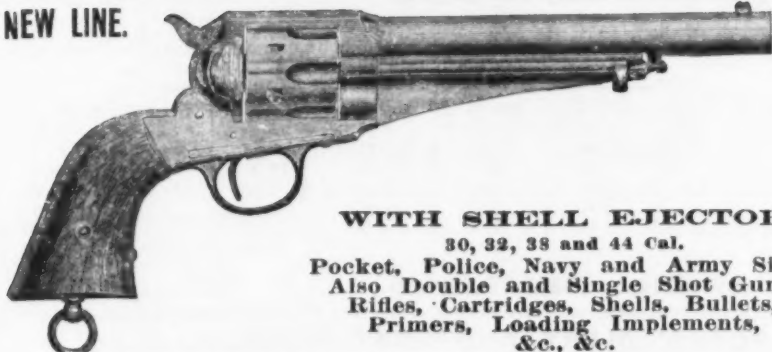
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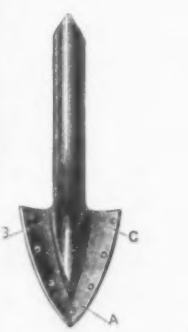
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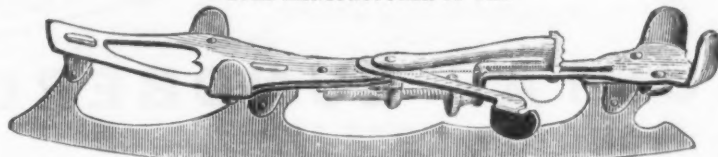
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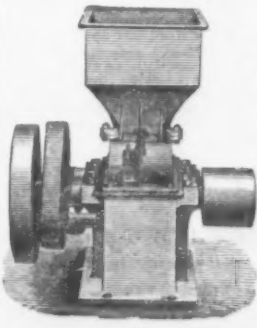


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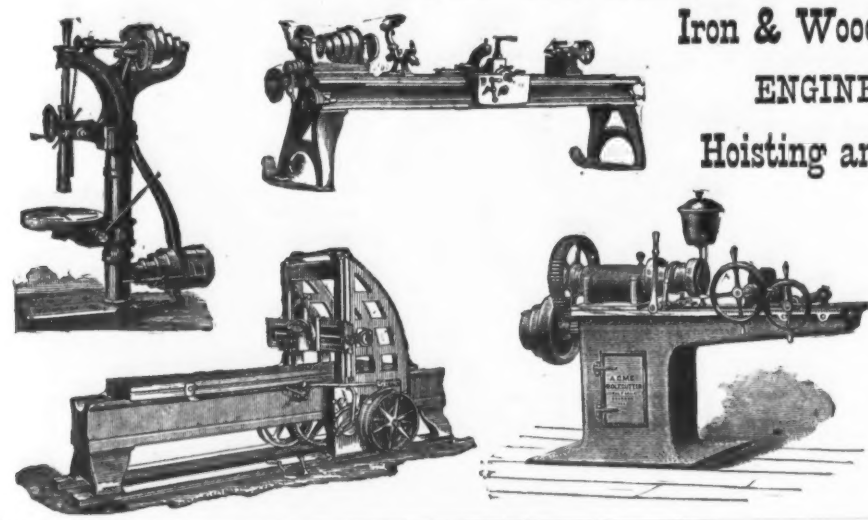
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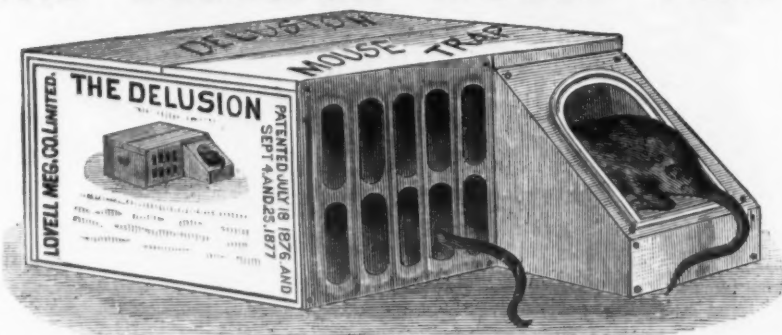
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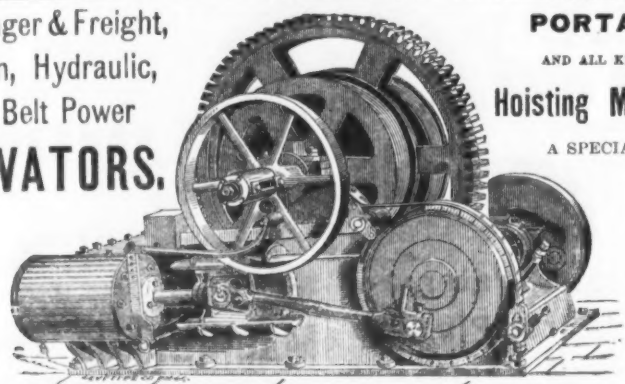
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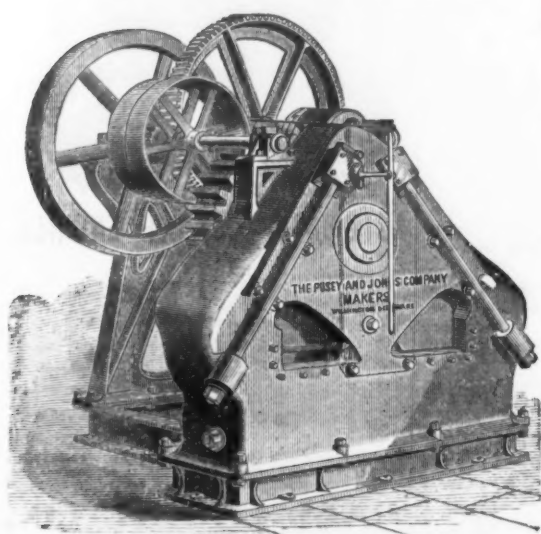
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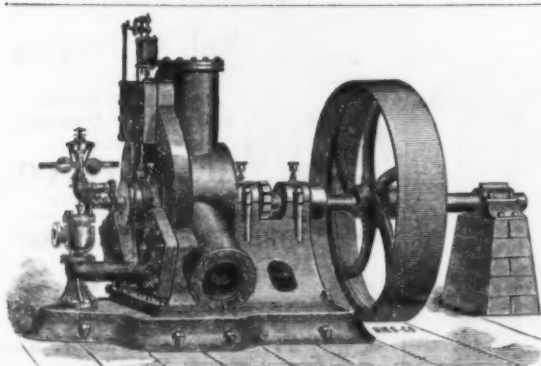
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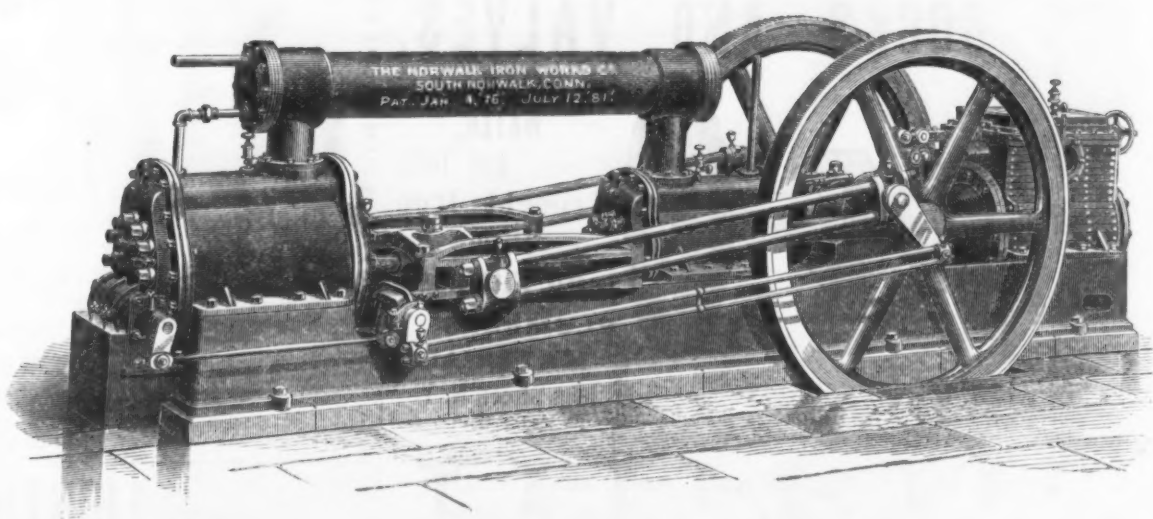
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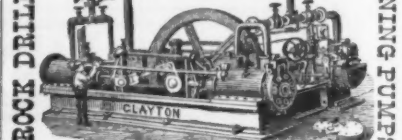
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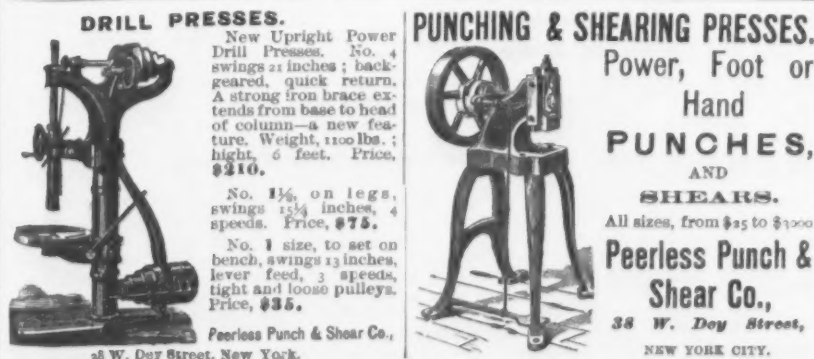
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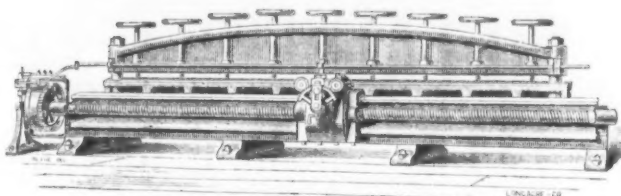
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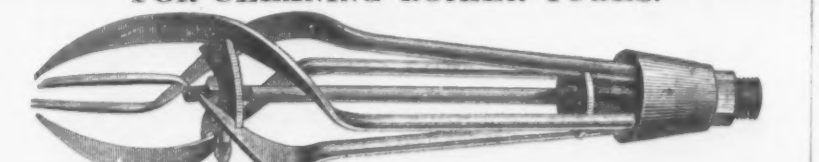
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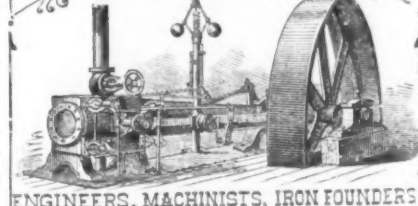
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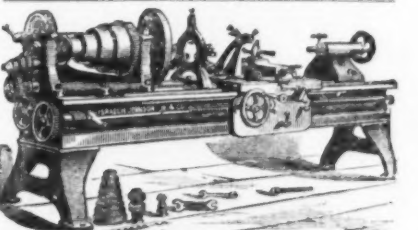
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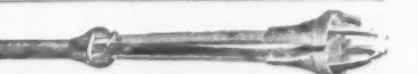


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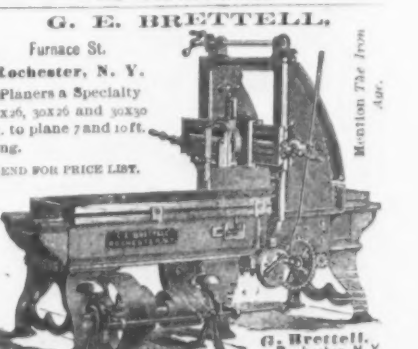


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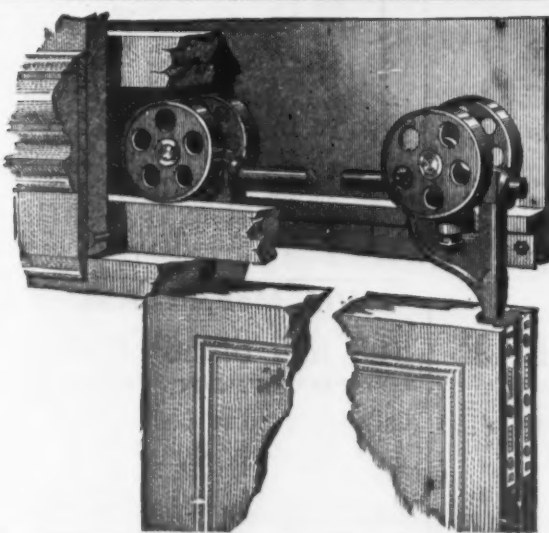
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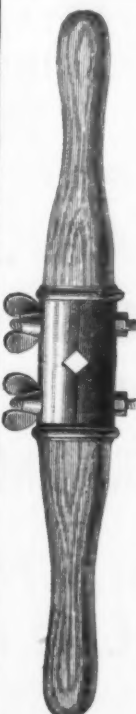
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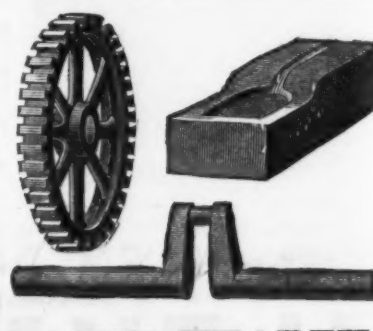
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